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No. _____

In the Supreme Court of the United States

Dr. Harry Gaus,

Petitioner,

v.

Conair Corporation,

Respondent.

ON PETITION FOR A WRIT OF CERTIORARI
TO THE UNITED STATES COURT OF APPEALS
FOR THE FEDERAL CIRCUIT

PETITION FOR WRIT OF CERTIORARI

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QUESTIONS PRESENTED

1. May limitations be read into the claims of a United States Patent from the specification without determining the plain and ordinary meaning of the claims and when there is no clear and unambiguous disclaimer in the specification, contrary to the Patent Statute and this Court's precedents?

2. Does this case satisfy the requirements for an order of grant of certiorari, vacation of judgment, and remand to the Federal Circuit, given that the Federal Circuit has granted an *en banc* rehearing in *Phillips v. AWH Corp.*, 2004 U.S. App. LEXIS 15065 (July 21, 2004), *granting reh'g en banc and vacating*, 363 F.3d 1207 (Fed. Cir. 2004), on the issue of claim construction and deference to the district court regarding claim construction, where the resolution of the issues on rehearing will determine the outcome of the pending litigation?

PARTIES TO THE PROCEEDING

The names of all parties in the court whose judgment is sought to be reviewed appear in the caption of this Petition for a Writ of *Certiorari*. The Petitioner is Dr. Harry Gaus, an individual.

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PETITION FOR A WRIT OF CERTIORARI

Dr. Harry Gaus ("Dr. Gaus") respectfully petitions for a writ of *certiorari* to review the judgment of the United States Court of Appeals for the Federal Circuit in this case.

OPINIONS BELOW

The opinion of the Federal Circuit is reported at 363 F.3d 1284 and reproduced in the Appendix ("A") at 1-14. The order denying panel rehearing and rehearing *en banc* is found at 2004 U.S. App. LEXIS 10423 and is reproduced at A71-72. The judgment of the District Court is unreported and is reproduced at A15-17. The District Court's January 31, 2003, Opinion and Order is found at 2003 U.S. Dist. LEXIS 1445 and is reproduced at A18-60. The District Court's March 3, 1998, Memorandum and Order is found at 1998 U.S. Dist. LEXIS 2339 and is reproduced at A61-70.

JURISDICTION

The District Court exercised jurisdiction pursuant to 28 U.S.C. §§ 636(c) and 1338. The District Court entered final judgment on March 5, 2003, which was appealed by Respondent Conair Corporation ("Conair") and cross-appealed by Dr. Gaus pursuant to 28 U.S.C. §§ 636(c)(3) and 1295(a). Judgment of the Federal Circuit was entered on April 1, 2004, and the order denying panel rehearing and rehearing *en banc* issued on May 6, 2004. The jurisdiction of this Court is invoked under 28 U.S.C. § 1254(1).

CONSTITUTIONAL AND STATUTORY PROVISIONS INVOLVED

Article 1, Section 8, clause 8 of the Constitution provides:

> Congress shall have the power . . . to promote the Progress of Science and useful Arts, by securing for limited Times to Authors and Inventors the exclusive Right to their Respective Writings and Discoveries.

35 U.S.C. § 112, ¶ 2 of the Patent Laws of the United States provides:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

STATEMENT OF THE CASE

Patent claims are the basis upon which inventors set forth their inventions and from that, the public determines the parameters of such inventions. A patent is a contract between the inventor and the United States, which secures to the inventor a limited period of exclusivity in return for public disclosure "to promote the Progress of Science and useful Arts . . ." U.S. Const., Art. I, Sec. 8, cl. 8.

Construction of patent claims is fundamental to patent law, and applies in each and every patent infringement case. The metes and bounds of a patent cannot be determined until the claims are construed.[1] This Court's precedents stress the central importance of the claim language as defining the scope of a patent. Because claim construction is the foundation of patent interpretation, it is imperative that a consistent methodology exist to determine the meaning of claim terms.

Despite the need for consistent and reasoned interpretation of claims, the Federal Circuit is badly fractured in its approach to claim construction. It has now admitted that its rulings are the source of inconsistency and confusion and granted an *en banc* rehearing in a similar case.[2] The issues raised by the Federal Circuit *en banc* include, *inter*

---

[1]"[T]o decide what the claims mean is nearly always to decide the case." *Markman v. Westview Instr., Inc.*, 52 F.3d 967, 989 (Fed. Cir. 1995) (*en banc*), *aff'd*, 517 U.S. 370 (1996) (Mayer, J., concurring).

[2]*See Phillips v. AWH Corp.*, __ F.3d __, 2004 U.S. App. LEXIS 15065 (Fed. Cir. July 21, 2004) (A104-110), a case decided only seven days after this case.

alia, the questions of how to interpret claims in light of the specification and what deference, if any, to give the district court's claim construction. *Phillips v. AWH Corp.*, __F.3d __, 2004 U.S. App. LEXIS 15065, *3 (Fed. Cir. July 21, 2004). A105-106.

Contrary to the Patent Statute and this Court's clear precedents, the Federal Circuit's decision in this case disregards the plain and ordinary meaning of the term "pair," overturning a judgment of almost $50 million dollars following a jury verdict. It limited "pair" to a "distinct component, separate from the electrical operating unit of the system." In so concluding, the Federal Circuit relied only upon selected statements in the specification. This decision ignores the Patent Statute, the Court's established principles regarding the paramount nature of claims, and the Federal Circuit's own principles requiring that the plain and ordinary meaning of a term be determined before looking to the specification for a clear disavowal of claim language.

A. The Gaus Patent.

United States Patent No. 4,589,047, entitled "Protective Mechanism In Electrically Operated Devices" ("the Gaus Patent"), relates to improved shock hazard protection devices for use in electrically powered apparatuses, such as hairdryers, to protect the consumer from lethal electric shocks when the apparatus comes into contact with water. It discloses a protective device for an electrically powered apparatus which responds to a conductive fluid that may enter the housing of the apparatus. A79.

The most familiar form of electric shock protection is the ground fault circuit interrupt ("GFCI"). GFCI devices are typically mounted in electrical outlets located near bathroom sinks. A GFCI will interrupt the flow of current to the outlet when it detects that the electrical path is leading to a ground (a zero voltage reference point). Such a circuit is called a "ground fault" because the path of electricity has been

prematurely routed to the ground condition instead of through its normal path.

Another form of shock protection is immersion detection circuit interrupt devices ("IDCI"). These devices utilize a probe to detect the presence of moisture irrespective of the ground conditions of the appliance. If moisture is present, the probe detects a change in impedance (that is, a change in current) that triggers a switch to shut off power to the appliance.

The Gaus Patent describes two approaches to dealing with the problem of moisture contacting electrical components within the apparatus. A79-80. The first approach includes devices where the interruption occurs: (a) over external leakage current protection switches located outside the apparatus and in the house wiring; (b) over switching relays; or (c) through the circuit protection system of the house wiring itself. *Id.* at 79. The term "external" refers to the house wiring itself. *Id.* The second approach integrates the protective device with the electrically powered apparatus. A80. The Gaus Patent is directed to the second approach, incorporating the protective device in the apparatus.[3] This allows a user to ensure the protection is always present, even if the apparatus is taken to a home that does not have a circuit protection system in the house wiring.

Claim 12 of the Gaus Patent was selected as the representative claim on which the parties proceeded during litigation. A62 n.1. Conair admitted prior to trial that its accused devices satisfy each and every limitation of claim 12 except for the "housing," "pair," and "fusible member" limitations. The relevant portion of claim 12 states:

> 12. A hazard prevention device for an electrical externally powered apparatus comprising:
>
> a housing, said housing having at least one opening and said housing comprising an electrical

[3] The apparatus is the entire appliance including the line cord.

> operating unit and a pair of spaced-apart electrically exposed conductive probe networks, said pair being responsive to the entry of a conductive fluid electrically reducing the impedance between said probe networks of said pair; . . . .

A97-98. Claim 12 does not require the protective device to be internal to the body of the apparatus. Rather, the claim requires only that the housing contain at least one opening; an electrical operating unit; and a pair of spaced-apart electrically exposed conductive probe networks. *Id.* Likewise, claim 12 does not require the pair of probe networks to be separate and independent from the electrical operating unit. The claim language states "an electrical operating unit and a pair of spaced apart electrically exposed conductive probe networks," not an electrical operating unit and a *separate* pair of spaced apart electrically exposed networks.

B. The Accused Device.

The Conair device is an IDCI, designed to prevent electric shocks when the apparatus comes into contact with water. Just as in the Gaus Patent, the Conair device includes a pair of probe networks for detecting the presence of water. In the Conair device, a sense wire is connected to a line wire, constituting a pair of probe networks. This pair triggers a circuit that disconnects power in the presence of water. A25. When water bridges the sense wire and the line element, the conductivity of the water decreases the impedance between them, causing a normally closed circuit to open, thus disconnecting power.

C. Dr. Gaus's Successful Patent Infringement Suit.

On August 4, 1994, Dr. Gaus brought suit against Conair for infringement of the Gaus Patent. A2. In 1996, Conair moved for summary judgment of non-infringement of claim 12, on the ground that its devices did not satisfy, *inter*

alia, the "pair" limitation. A62-63. The district court followed proper claim construction methodology and construed "pair" by first looking to the claim language and then consulting a dictionary to determine the ordinary meaning:

> First, what constitutes a "pair of spaced-apart electrically exposed conductive probe networks" may indeed mean "two corresponding things designed for use together" as Conair suggests. It could also mean, however, "a single thing made up of two corresponding parts that are used together [*a pair of pants*]." Webster's New World Dictionary, 3d College Edition (1988). The Gaus Patent specifically states that the "object of the invention . . . is achieved . . . by a combination of components having [inter alia] . . . a probe at the boundaries of the housing openings and housing gaps, in the form of an open i.e., exposed electrical double conductor". Gaus Patent, Summary of the Invention, Column 3, lines 1-5 (emphasis supplied). The term "pair", therefore, cannot be limited as narrowly as Conair suggests.

A67. Based upon this construction, the district court denied Conair's motion.

Following a nine day trial, the jury found that Conair infringed claim 12, and that the infringement was willful. A15. The jury awarded Dr. Gaus $28.5 million in compensatory damages, and the district court enhanced that award by $8,550,000 because of Conair's willful infringement. A15-16.

Conair filed a renewed motion for judgment as a matter of law or in the alternative for a new trial. A18. The trial court denied all of Conair's post-trial motions, noting that the evidence was "more than sufficient to support the

jury's verdict." A23, 58. The trial court cited to testimony of Conair's own expert and former employee, who admitted that the sense wire in Conair's accused device would not function in the intended manner unless it was paired up with (i.e., connected to) the hot phase line. A25-26. "This gave greater credence to Gaus's contention that the Conair device contained the substantial equivalent of the 'pair of spaced apart electrically exposed probe networks' limitation found in Claim 12." A25. Conair's expert also admitted that if the word "pair" in the "pair of probe networks" limitation were construed to mean two corresponding parts used together, as in a "pair of pants," his opinion that this element was not found in the accused device would be undermined.[4] *Id.*

D. The Federal Circuit's Flawed Claim Construction.

The Federal Circuit reversed the jury verdict without any discussion of plain and ordinary meaning, basing its entire decision on an improper construction of claim 12. The panel failed to follow the Patent Statute, this Court's precedents, and its own precedents setting forth the methodology for claim construction. Rather than beginning and ending with the words of the claim, the panel began and ended with a few ambiguous statements in the specification describing one of several preferred embodiments. In addition, it ignored Federal Circuit precedent conferring a "heavy presumption" that a claim term carries its ordinary and customary meaning. The Federal Circuit ignored the prohibition of importing limitations from the specification. It created an unprecedented and untenable doctrine of "specification estoppel," a term that had never been used by the Federal Circuit before. However, it did not give any

[4] "This construction, of course, is precisely what Judge Duffy concluded the term 'pair' meant when he was asked to construe it in *Conair I*." A19, 25.

guidance as to what that term means or when it applies. Moreover, the panel did not give the district court's claim construction any deference, failing to even mention the district court's claim construction that properly interpreted the ordinary meaning of the word "pair."

The district court properly afforded the term "pair" the full range of its ordinary meaning. The panel, however, failed to do so. Rather, in an analysis that consumes all of two sentences, and without mentioning the district court's construction and without consulting a dictionary, the panel simply proclaimed that "the clear implication of the claim language" is that the "pair" is a "distinct component, separate from the electrical operating unit of the claimed invention." A7-8. Merely because the claim lists both "pair" and "electrical operating unit," the panel imported the structural requirement that "pair" must be separate and independent from the "electrical operating unit." *Id.* This construction is erroneous. The claim language does not say an electrical operating unit and a *separate* pair of spaced-apart probes. *See* A93. Moreover, just because terms are separately recited in a claim does not mean one excludes the other. *See Inverness Med. Switz. GmbH v. Princeton Biomeditech Corp.*, 309 F.3d 1365, 1371 (Fed. Cir. 2002). The Federal Circuit never considered the plain and ordinary meaning of the term, but rather went straight to the specification and imported a limitation, "separate," effectively changing the language and scope of the claims. A7-12.

Without pointing to a single statement that expressly showed a clear intent to disavow subject matter, the panel inferred a disclaimer from a few excerpts regarding particular embodiments. The excerpt stating that the "electrical double conductor of the probe should be configured . . . " (A9) was taken from the Description of the Preferred Embodiments. It refers only to one embodiment and specifically uses the permissive language "should" rather than the mandatory language "must." A89. Use of such permissive language

does not justify importing a limitation into a claim. *See Prima Tek II, L.L.C. v. Polypap, S.A.R.L.*, 318 F.3d 1143, 1151 (Fed. Cir. 2003).

The excerpt regarding how far apart the probes should be separated (A9-10) also was taken from the Description of the Preferred Embodiments. It too refers only to an embodiment of the invention, not the invention itself. A89.

The only excerpt from the specification seized upon by the panel that even arguably describes the invention merely discusses one embodiment that disconnects "before the user can be connected to voltage-carrying exposed parts via the fluid which has entered the housing." A9, 83. The panel proclaimed that this description "plainly contemplates" that a structural separation is "essential" to the operation of the device. A9. However, merely because one purpose of a preferred embodiment may have been to accomplish a disconnect "before the user can be connected to voltage-carrying exposed parts," it does not rise to the level of a disclaimer sufficient to change the words of the claim. *See E-Pass Tech., Inc. v. 3Com Corp.*, 343 F.3d 1364, 1370 (Fed. Cir. 2003).

Worse still, the panel ignored the clear and unambiguous specification language describing the essentials of the invention:

> (a) A probe at the boundaries of the housing openings and housing gaps, in the form of an open i.e., exposed electrical double conductor which is inaccessible during the handling of the apparatus but which changes its impedance when a conducting liquid is present

A82 (emphasis added). This excerpt clearly shows the specification described "pair" to encompass not only two things designed for use together, but also a single thing made up of two corresponding parts designed for use together. This

is precisely the ordinary definition of "pair" the district court used and the panel ignored.

REASONS FOR GRANTING THE WRIT

Dr. Gaus seeks review because: (1) the judgment below is in direct conflict with this Court's precedents and the Patent Statute; (2) the judgment below further elevates the fundamental conflict and uncertainty concerning proper claim construction, rendering claim requirements and the notice function of claims meaningless; and (3) the *en banc* rehearing in the *Phillips* case will directly determine the outcome of this case, resulting in possible reinstatement of the jury verdict.

"Because the Federal Circuit has exclusive jurisdiction over appeals . . . in patent litigation," the rules it develops have a greater tendency to be cert-worthy "matter[s] of special importance to the entire Nation." *Cardinal Chem. Co. v. Morton Int'l, Inc.*, 508 U.S. 83, 89 (1993); *see also* Sup. Ct. R. 10(c). The Federal Circuit's exclusive jurisdiction of patent appeals from district courts makes it impossible for the issues presented here to be deliberated in other circuits. However, these issues have been ventilated and thoroughly explored in the Federal Circuit, resulting in a fundamental, outcome-determinative conflict concerning claim construction. This conflict and uncertainty has been developing ever since *Markman v. Westview Instr., Inc.*, 517 U.S. 370 (1996), placing claim construction exclusively within the province of the court. The time is ripe for this Court to again provide guidance and certainty to claim construction issues. Allowing the issues to percolate any longer will merely result in further chaos to claim construction jurisprudence.

Claiming became a requirement for all patents in the Patent Act of 1870, and it was accepted that the claims "measure the invention." *General Elec. Co. v. Wabash Appliance Corp.*, 304 U.S. 364, 369 (1938), *quoting Continental Paper Bag Co. v. E. Paper Bag Co.*, 210 U.S.

405, 419 (1908). The words of the claims are of paramount importance, required by statute, compelling the patentee to precisely define his invention. 35 U.S.C. § 112, ¶ 2. Abandoning the language of the claims, the Federal Circuit's decision below promotes a principle in direct contradiction to this Court's precedents established more than a century ago, and thwarts statutory claim requirements.

The Federal Circuit was established to promote certainty and uniformity in questions of patent law. Claim construction was given to the Federal Circuit to take advantage of uniformity and certainty in determining the scope of claims. *Markman v. Westview Instr., Inc.*, 52 F. 3d 967, 978-81 (Fed. Cir. 1995) (*en banc*), *aff'd*, 517 U.S. 370 (1996). Despite *Markman*'s effort to achieve certainty in this fundamental area of patent law, various panels of the Federal Circuit have continued to use starkly different approaches to claim construction in similar cases. Indeed, there is no principled basis for drawing distinctions between cases, even from the same panel.

The uncertainty and unpredictability in the Federal Circuit unsettles expectations, eviscerates the notice function of the claims, and renders claim requirements useless. Inventors and the public are unable to interpret claims and determine the scope of property rights, not knowing whether the claims or the specification will measure the invention. This case is a stark example of how the uncertainty affects the over one million patents that presently exist, the many inventors in the midst of the application process, and the considerations of those who are creating new inventions. This vital issue is certain to recur, and this Court should address it now to reestablish certainty and uniformity in questions of claim construction.

I. THE DECISION OF THE FEDERAL CIRCUIT CONFLICTS DIRECTLY WITH ESTABLISHED DECISIONS OF THIS COURT AND THE PATENT STATUTE.

The Patent Act of 1836 required the inventor to describe the invention in the specification and drawings. He needed to "particularly specify and point out the part, improvement, or combination, which he claim[ed] as his own invention." Act of July 4, 1836, ch. 357, § 6, 5 Stat. 117, 119. The 1836 Act was replaced by the Patent Act of 1870, which specifically distinguished the specification from the claims, and required an applicant to "particularly point out and distinctly claim the invention." Act of July 8, 1870, ch. 230, § 26, 16 Stat. 201. With the Patent Act of 1952, an applicant was required to define an invention "particularly" and "distinctly" with one or more claims. 35 U.S.C. § 112, ¶ 2. The section on claiming in the 1952 Act was separated into its own paragraph to emphasize the distinction between the claims and the specification.[5]

Claims provide a way to define an invention and provide notice to the public. *See White v. Dunbar*, 119 U.S. 47, 52 (1886). Claims are the "measure [of] the invention." *General Elec. Co. v. Wabash Appliance Corp.*, 304 U.S. at 369. Because a claim is the measure of an invention, the terms used to make up the claim are central to its interpretation.

This Court has underscored the fundamental importance of claim terms and the impropriety and illegality of changing the plain and ordinary meaning of those terms:

> Some persons seem to suppose that a claim in a patent is like a nose of wax which may be turned and twisted in any direction, by merely referring

[5] S. Rep. No. 1979, at 14 (1952) ("The clause relating to the claim [in § 112] is made a separate paragraph to emphasize the distinction between the description and the claim or definition and the language is modified.").

> to the specification, so as to make it include something more than, or something different from, what its words express. The context may, undoubtedly, be resorted to, and often is resorted to, for the purpose of better understanding the meaning of the claim; but not for the purpose of changing it, and making it different from what it is. The claim is a statutory requirement, prescribed for the very purpose of making the patentee define precisely what his invention is; and it is unjust to the public, as well as an evasion of the law, to construe it in a manner different from the plain import of its terms.

White v. Dunbar, 119 U.S. at 51-52.

Because the claims define the invention, this Court has held that it is improper to change the claims based upon the specification. *Howe Machine v. National Needle,* 134 U.S. 388, 394 (1890) ("[T]he specification and drawings are usually looked at only for the purpose of better understanding the meaning of the claim, and certainly not for the purpose of changing it and making it different from what it is."). The prohibition and danger of importing limitations from patent specifications was further articulated by this Court:

> [W]e know of no principle of law which would authorize us to read into a claim an element which is not present, for the purpose of making out a case of novelty or infringement. The difficulty is that if we once begin to include elements not mentioned in the claim in order to limit such claim . . . , we should never know when to stop.

McCarty v. Lehigh Valley R.R., 160 U.S. 110, 116 (1895). This principle has not varied, but rather, has been reiterated by courts through the years.[6]

In 1935, this Court stressed that the specification shows a way of using the inventor's method, but he is not confined to that particular mode of use since the claims of the patent, not its specification, measure the invention. *See Smith v. Snow*, 294 U.S. 1, 11-12 (1935). In that case, the inventor had developed a system for incubating eggs and the specification indicated a particular arrangement of the eggs from the top to the bottom of the tiers of trays. *Id.* at 10. Although the specification and the drawings represented a particular arrangement of the eggs, this Court concluded that the specification just detailed a way of using the inventor's method, and that he was not limited to the form described in the specification. *Id.* at 11. Here, the Federal Circuit's ruling directly contradicts this holding by limiting the Gaus Patent as requiring separate structures only based upon the description in the specification. A8-11. This is particularly improper as the specification states the invention is not limited to the described embodiments.[7]

Over one-hundred years after *McCarty*, this principle was again affirmed in *Markman v. Westview Instr., Inc.* In citing to the language of 35 U.S.C. § 112, this Court acknowledged that a patent includes two distinct elements.

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[6] The *McCarty* case is repeatedly cited by the Federal Circuit for this principle. *See, e.g., Biovail Corp. Int'l v. Andrx Pharm., Inc.*, 239 F.3d 1297, 1301 (Fed. Cir. 2001) (stating that *McCarty* stands for the proposition that "a limitation that does not exist in a claim should not be read into that claim."); *Johnson Worldwide Assoc., Inc. v. Zebco Corp.*, 175 F.3d 985, 989-990 (Fed. Cir. 1999) ("claim terms cannot be narrowed by reference to the written description or prosecution history unless the language of the claims invites reference to those sources," citing *McCarty*.).

[7] The Description of the Preferred Embodiments contains numerous statements refuting the notion that the entire invention was expressly limited to the described embodiments. *See* A86, 88, 90, 91, 92, 93.

First, a patent contains a specification describing the invention. Second, a patent includes one or more claims which particularly point out and distinctly claim the subject matter which the applicant regards as his invention. The claim defines the scope of a patent grant. 517 U.S. at 373.

Some panels of the Federal Circuit have adopted the principle that claims measure the invention, finding that the interpretation of the patent's claims begins and remains centered on the words of the claim themselves. *Texas Digital Sys., Inc. v. Telegenix, Inc.*, 308 F.3d 1193, 1201-1202 (Fed. Cir. 2002). "In the absence of an express intent to impart a novel meaning to the claim terms, the words take on the full breadth of the ordinary and customary meanings attributed to them by those of ordinary skill in the art." *Ferguson Beauregard v. Mega Sys.*, 350 F.3d 1327, 1338 (Fed. Cir. 2003); *see Teleflex, Inc. v. Ficosa N. Am. Corp.*, 299 F.3d 1313, 1325 (Fed. Cir. 2002). In fact, the court must "indulge a 'heavy presumption' that a claim term carries its ordinary and customary meaning." *Texas Digital Sys., Inc. v. Telegenix, Inc.*, 308 F.3d at 1202. Limitations from the specification must not be imported into the claim. *Liebel-Flarsheim Co. v. Medrad, Inc.*, 358 F.3d 898, 904 (Fed. Cir. 2004); *see Renishaw PLC v. Marposs Societa' per Azioni*, 158 F. 3d 1243, 1248 (Fed. Cir. 1998) ("[O]ne may not read a limitation into a claim from the written description.").

Claim construction properly determined under this approach is similar to statutory construction, which begins with the language of the statute. *Diamond v. Chakrabarty*, 447 U.S. 303, 308 (1980). When construing statutes, "unless otherwise defined, words will be interpreted as taking their ordinary, contemporary, common meaning," and courts "should not read into the patent laws limitations and conditions which the legislature has not expressed." *Id.* (citations omitted). Guided by these canons of construction, the Court gave the term "manufacture" its full meaning in accordance with its dictionary definition. *Id.*

The most central aspect of patent law, claim construction, is the determination of the meaning and scope of patent claims. The court is required to determine claim construction as a matter of law, beginning and ending with the meaning of the claim terms themselves. However, the Federal Circuit now employs a claim construction methodology du jour, effectively turning patent claims into "a nose of wax," and embarking down the slippery slope prohibited more than a century ago in *McCarty*. The result has been chaos.

II. THIS COURT SHOULD PROVIDE GUIDANCE AND CLARITY TO FUNDAMENTAL AND RECURRING ISSUES OF CLAIM CONSTRUCTION.

Claim construction is an issue of patent law that is worthy of review by this Court because: (1) it is required in all patent infringement cases, and (2) the Federal Circuit fails to use a consistent and analytical construct to interpret claims. The ability to assess the scope of a patent claim through a consistent methodology in order to achieve predictable results is of paramount importance. A patent must describe the exact scope of an invention and its manufacture to "secure to [the patentee] all to which he is entitled, [and] to apprise the public of what is still open to them." *McClain v. Ortmayer*, 141 U.S. 419, 424 (1891).

A. Claim Construction Questions Are Important And Recurring, Requiring Certainty And Predictability.

The Federal Courts Improvement Act established the Federal Circuit as the exclusive venue for patent appeals. Federal Courts Improvement Act of 1982, Pub. L. No. 97-164, 96 Stat. 25 (codified at 28 U.S.C. § 1295(a)(1)). The Federal Circuit was created as a response to widespread dissatisfaction due to confusion and uncertainty existing under the decentralized administration of patent law. *See* S. Rep. No. 97-275, at 14-16 (1981), *reprinted in* 1982

U.S.C.C.A.N. 11, 14-15 (the creation of a centralized court to hear suits related to patents will provide doctrinal stability in the field of patent law, which will decrease unnecessary uncertainties in the patent system and thereby increase innovation); H.R. Rep. No. 97-312, at 22-23 (1981) ("A single court of appeals for patent cases will promote certainty where it is lacking to a significant degree . . ."). The benefits of a centralized court were a clearer, more coherent, and more predictable body of patent law. *Id.* at 20-23.

The importance of uniformity was reiterated by this Court in *Markman* to support its decision to allocate all issues of claim construction to the court. *Markman v. Westview Instr., Inc.*, 517 U.S. at 390-391. This Court acknowledged:

> [t]he limits of a patent must be known for the protection of the patentee, the encouragement of the inventive genius of others and the assurance that the subject of the patent will be dedicated ultimately to the public. Otherwise, a "zone of uncertainty which enterprise and experimentation may enter only at the risk of infringement claims would discourage invention only a little less than unequivocal foreclosure of the field," and "[t]he public [would] be deprived of rights supposed to belong to it, without being clearly told what it is that limits these rights."

Id. at 390 (citations omitted).

The Federal Circuit's conflicting decisions regarding claim construction defeat the Congressional purpose in the creation of the Federal Circuit and result in confusion and uncertainty. The Court should grant this Petition to restore doctrinal stability and certainty to patent law.

B. The Federal Circuit's Decisions Regarding Claim Construction Are Inconsistent And Result In Confusion And Uncertainty.

Despite the clear precedents forbidding limitations from the specification to be read into claims, the Federal Circuit has limited claims based upon the specification without any articulable legal justification. This panel – like many before it – has disregarded these precedents and has read limitations into claim terms without regard to their plain and ordinary meaning. The unfortunate result is a collection of inconsistent decisions, establishing uncertainty and confusion among inventors and the public. The Federal Circuit has now acknowledged this egregious problem, and has granted *en banc* rehearing "to resolve issues concerning the construction of patent claims." A105. The severity of the conflicts and confusion in the Federal Circuit is demonstrated by its request to brief seven different questions, with multiple sub-parts. *Id.* at A105-106, 109.

The *McCarty* court cautioned against reading limitations into claims, fearing a slippery slope that would stagger out of control, rendering claim language useless. Unfortunately, this cautionary speculation has become all too real. As Circuit Judge Dyk has pointed out: "our decisions provide inadequate guidance as to when it is appropriate to look to the specification to narrow the claim by interpretation and when it is not appropriate to do so. Until we provide better guidance, I fear that the lower courts and litigants will remain confused." *SciMed Life Sys., Inc. v. Advanced Cardiovascular Sys.*, 242 F.3d 1337, 1347 (Fed. Cir. 2001) (Dyk, J., concurring). Judge Dyk's assessment of the inconsistency of the Federal Circuit decisions regarding the relationship between the specification and the claims has become more acute and is confirmed by the Federal Circuit's recent grant of *en banc* rehearing on these very issues.

The panel's decision in this case renders prophetic Judge Dyk's concurring opinion in *SciMed*. More recently,

Judge Dyk has again stated that a panel decision "attempts to work a major and unfortunate change in our recent claim construction jurisprudence." *Phillips v. AWH Corp.*, 363 F.3d 1207, 1216 (Fed. Cir. 2004) (Dyk, J. dissenting), *reh'g en banc granted, judgment vacated by* __ F.3d __, 2004 U.S. App. LEXIS 15065 (July 21, 2004). Moreover, no clear guidance exists instructing litigants and courts – including the Federal Circuit – how specification disclaimer or the new term used by the Federal Circuit for the first time in this case – "specification estoppel" – fits into proper claim construction methodology. No clear guidance exists instructing litigants and courts as to the consequences of "specification estoppel."

This case provides an extreme example of how far down the slippery slope the Federal Circuit has fallen, essentially rendering claim language meaningless. The Federal Circuit has held that "if an apparatus claim recites a general structure (e.g., a noun) without limiting that structure to a specific subset of structures (e.g., with an adjective), we will generally construe the claim to cover all known types of that structure that are supported by the patent disclosure." *Renishaw PLC v. Marposs Societa' per Azioni,* 158 F.3d at 1250. Yet, the Gaus Patent uses the noun "pair" without limitation and the specification clearly supports the ordinary meaning accorded the term by the district court. *Cf. Liebel-Flarsheim Co. v. Medrad, Inc.*, 358 F.3d 898, 912 (Fed. Cir. 2004) (limitations from the specification must not be imported into the claims);[8] *Inverness Med. Switz. GmbH v. Princeton Biomeditech Corp.*, 309 F.3d at 1371 (merely because two terms are "separately recited" in a claim, does not suggest that one excludes the other).

The inconsistency of the Federal Circuit's approach to claim construction directly affects the outcome of patent

[8] In the *Liebel-Flarsheim Co.* case, Medrad, Inc. filed a petition for a writ of *certiorari* on July 1, 2004, based upon the outcome determinative "intracircuit split" within the Federal Circuit on patent claim construction issues.

infringement cases. Similar cases have resulted in dissimilar outcomes. For example, in *E-Pass Tech., Inc. v. 3Com Corp.*, 343 F.3d at 1369-71, the Federal Circuit determined that the plain and ordinary meaning of the term "electronic multi-function card" was not limited to the dimensions of a credit card. Even though the specification discussed the "invention" in the context of a device that takes on the dimensions of a credit card, the court refused to find this language sufficient to create a disclaimer of cards not having such dimensions. *Id.* In contrast, in some cases the Federal Circuit looks to the specification without justification and limits the plain and ordinary meaning. In *Phillips v. AWH Corp.*, 363 F.3d at 1213, the patent described "baffles" at different angles, including ninety-degree angles. However, the Federal Circuit focused on other, selected portions of the specification and limited the term "baffles" to angles other than ninety-degree angles, affirming a finding of noninfringment. *Id.* Similarly, in this case, the Federal Circuit went directly to the specification, and limited the claim term "pair" to require separate structures, reversing a jury finding of infringement. A2-5, 7-12.

The panel's decision further violates established precedent requiring specification language to constitute a manifest exclusion or restriction representing a clear disavowal of claim scope. *International Rectifier v. IXYS Corp.*, 361 F.3d 1363, 1370 (Fed. Cir. 2004); *Liebel-Flarsheim Co. v. Medrad, Inc.*, 358 F.3d at 906. The panel elevated a single object of the invention into a limitation that "pair" and "electrical operating unit" must be separate without acknowledging the "clear and manifest" standard for specification disclaimer previously announced by some panels. No longer can inventors and the public rely upon the language of the claims to determine the scope of the patent, but must guess at whether the court will consider the claims or the specification as defining the parameters of the invention.

This Court has recognized the importance of consistent and clear claim construction and has utilized its supervisory authority to remedy inconsistency and uncertainty in issues of patent law. In *Markman*, this Court recognized the need for consistency and clarified the question of whether the interpretation of claims should be a factual or legal question. *Markman v. Westview Instr., Inc.*, 517 U.S. at 372. The Court held claim interpretation issues are purely legal questions, citing the importance of uniformity as an independent reason to allocate issues of construction to the court. *Id.* at 390.

In 1998, this Court granted *certiorari* to clarify section 102(b) of the Patent Act, which provides that no person is entitled to patent an "invention" that has been "on sale" more than one year before filing a patent application. *Pfaff v. Wells Electr., Inc.*, 525 U.S. 55, 57 (1998). Uncertainty existed as to whether or not the commercial marketing of a newly invented product may mark the beginning of the one year period, even though the invention had not been reduced to practice. *Id.* This Court utilized its supervisory authority and determined that the product must be the subject of a commercial offer for sale, and the invention must be ready for patenting. *Id.*

In 2001, this Court granted *certiorari* to clarify the scope of prosecution history estoppel and its relationship to the doctrine of equivalents. *See Festo v. Shoketsu Kinzoku Kogyo Kabushiki Co.*, 535 U.S. 722, 726 (2002). In further reducing uncertainty, this Court determined that prosecution history estoppel may apply to any claim amendment made to satisfy the Patent Act's requirements, not just to amendments made to avoid the prior art, but estoppel need not bar suit against every equivalent to the amended claim element. *Id.*

The next step in the progression of clarifying and stabilizing patent law issues must be this case. The Court should grant this Petition in order to resolve the inconsistency within the Federal Circuit and to ensure that this Court's

decisions regarding interpretation of patent claim terms are properly and uniformly applied.[9] These issues will continue to arise as claim construction is necessarily the first step in any patent infringement case. Unless this Court clarifies the effect of specification language in claim construction, the issue will continue to confound the lower courts, inventors, the public, and litigants.

C. The Federal Circuit's Claim Construction Renders Notice Requirements Of Patent Law Meaningless.

The Federal Circuit's admitted internal conflict in claim construction approaches not only undermines the most fundamental principles governing the construction of patent claims but also renders the important notice function useless.

> Accurate description of the invention is required by the law, for several important purposes: 1. That the government may know what is granted, and what will become public property when the term of the monopoly expires. 2. That licensed persons desiring to practise [*sic*] the invention may know during the term how to make, construct, and use the invention. 3. That other inventors may know what part of the field of invention is unoccupied.

Bates v. Coe, 98 U.S. 31, 39 (1878); *see Markman v. Westview Instr., Inc.*, 517 U.S. at 390 ("[T]he limits of a

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[9] The Federal Circuit will attempt to "resolve issues concerning the construction of patent claims" in an *en banc* rehearing in the *Phillips* case. *Phillips v. AWH Corp.*, __ F.3d __ , 2004 U.S. App. LEXIS at *3. A110. However, because of the widespread inconsistency between panels, it is possible that these issues will not be settled. As Chief Judge Mayer stressed in his dissent, "Until the court is willing to reconsider its holdings . . . that claim construction is a pure question of law subject to *de novo* review in this court, any attempt to refine the process is futile. . . . [B]ecause I am convinced that shuffling our current precedent merely continues a charade, I dissent from the *en banc* order." *Id.* (Mayer, C.J., dissenting). A110.

patent must be known for the protection of the patentee, the encouragement of the inventive genius of others and the assurance that the subject of the patent will be dedicated ultimately to the public.").

Because of the divergent approaches to claim construction, the metes and bounds of a claim are changed depending upon the approach taken by a panel. Although some panels of the Federal Circuit have ruled that there must be a clear and manifest disclaimer, in this case, the panel only mentioned it in a footnote, then introduced the new term "specification estoppel." A5, 6. This Court's intent to respect the historic assumptions of the patent system has been explicit: "To change so substantially the rules of the game now could very well subvert the various balances the PTO sought to strike when issuing the numerous patents which have not yet expired and which would be affected by our decision." *Warner-Jenkinson v. Hilton Davis Chem. Co.*, 520 U.S. 17, 32 n.6 (1997). The undefined specification estoppel created by the Federal Circuit renders claiming irrelevant by erroneously giving weight to the specification over the claim terms themselves in violation of the Patent Statue and over 100 years of precedents.

In addition, if specification language discussing a preferred embodiment is employed to narrow broad claim language, as was done here, future patent applicants will seek to minimize any discussion of preferred embodiments in their patent specification.[10] There is no consistency in the Federal Circuit, making it impossible to determine the parameters of any patent, thereby eviscerating the notice requirements.

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[10] In the Gaus Patent, the Summary of the Invention states in at least five locations that the drawings and the Description of the Preferred Embodiments are merely exemplary and not exhaustive. *See* A83-85. The Description of the Preferred Embodiments further contains numerous statements refuting the notion that the entire invention was expressly limited to the described embodiments. *See* A86, 88, 90, 91-93.

III. THIS CASE SATISFIES THE REQUIREMENTS FOR A GRANT OF *CERTIORARI*, VACATION OF THE JUDGMENT, AND REMAND TO THE FEDERAL CIRCUIT.

Dr. Gaus alternatively requests that the Court grant a writ of *certiorari* and vacate the judgment and remand the case to the Federal Circuit for reconsideration in light of the forthcoming decision in *Phillips*. This Court applies a "reasonable standard" in assessing whether to enter a grant of *certiorari*, vacation of judgment, and remand ("GVR order"). *Lawrence v. Chater*, 516 U.S. 163, 167 (1996).[11]

> Where intervening developments, or recent developments that we have reason to believe the court below did not fully consider, reveal a reasonable probability that the decision below rests upon a premise that the lower court would reject if given the opportunity for further consideration, and where it appears that such a redetermination may determine the ultimate outcome of the litigation, a GVR order is, we believe, potentially appropriate.

Id. This case plainly meets the Court's standard for granting GVR because relevant intervening post-appeal events have the potential to change the outcome of this litigation. The Federal Circuit recently granted *en banc* rehearing in *Phillips*, recognizing that its inconsistent decisions with regard to claim construction issues must be resolved. *Phillips* was decided only seven days after the panel's ruling here. The issues raised for consideration *en banc* include whether the

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[11] "[W]e have never regarded Rule 10, which indicates the general character of reasons for which we will grant *plenary consideration*, as applicable to our practice of GVR'ing. Indeed, *most* of the cases in which we exercise our power to GVR plainly do not meet the 'tests' set forth in Rule 10." *Thomas v. American Home Prods., Inc.* 519 U.S. 913, 914-915 (1996) (Scalia, J., concurring)(emphasis in original).

specification can limit the full scope of the plain and ordinary meaning of claim language, and whether it is appropriate to give deference to district court claim construction rulings. *Phillips v. AWH Corp.*, __ F.3d __, 2004 U.S. App. LEXIS 15065 (July 21, 2004). A104-106.

The determination of these issues will directly affect the result of this case because the Federal Circuit based its reversal of an almost $50 million dollar judgment on improperly importing a limitation from the specification when construing the claim term "pair." A2-3, 7-14. Not granting a GVR in this instance would result in a miscarriage of justice, denying the Federal Circuit the opportunity to reevaluate this case once the law on claim construction is clarified and hopefully settled.

A. A Grant, Vacate, And Remand Order Improves The Fairness And Accuracy Of The Judicial Outcome In This Case.

This case fits within the category of cases in which the Court has held it proper to issue a GVR order. A GVR order promotes justice by avoiding different outcomes between cases that have similar issues. *Lawrence v. Chater,* 516 U.S. at 168; *see Stutson v. United States*, 516 U.S. 193, 197 (1996) ("[A] GVR order both promotes fairness and respects the dignity of the Court of Appeals by enabling it to consider potentially relevant decisions and argument that were not previously before it").

Both the *Phillips* case and the present case pose identical issues: whether in interpreting a patent claim, the specification can limit the full scope of the plain and ordinary meaning of the claim language; and whether, and in what aspects, it is appropriate to accord any deference to the trial court's claim construction rulings. The Federal Circuit will also decide the role of dictionaries in determining the plain and ordinary meaning of claim terms. Dr. Gaus' case is still pending, albeit before this Court, while the Federal Circuit

considers a case that may dictate a different result. It would be unjust to conclude this case on the eve of creation of new precedent that could restore the jury verdict to Dr. Gaus.

Typically, this Court issues a GVR order when it has granted a petition for writ of certiorari in one case, while a different case presenting a common issue seeks a writ of certiorari at the same time. The second case is often granted a GVR order so that the lower court may consider the impact of the Supreme Court's ruling in the first case. *See Lawrence v. Chater,* 516 U.S. at 180 (Scalia, J., dissenting) (observing that "[t]his is undoubtedly the largest category of 'GVRs' that now exists"). GVR orders are not, however, limited to Supreme Court review of a similar case. *See id.* at 166-67. GVR orders are granted based "in light of a wide range of developments, including [United States Supreme Court] decisions, State Supreme Court decisions, new federal statutes, administrative reinterpretations of federal statutes..." *Id.* (citations omitted).

The Federal Circuit's recent grant of *en banc* rehearing in *Phillips* presents a situation analogous to a grant of *certiorari* by this Court where an intervening state supreme court decision affects the outcome of a case. *See, e.g., Gulf, Colo. & Santa Fe Ry. Co. v. Dennis*, 224 U.S. 503 (1912). Because the Federal Circuit is the sole and highest court of appeal for patent law issues, it is similar to the highest level of appeal on a state level. The *en banc* rehearing will establish precedent for the Federal Circuit. Therefore, the Federal Circuit should have an opportunity to reconsider Dr. Gaus's appeal in light of the precedent it will create in *Phillips*.

"Whether a GVR order is ultimately appropriate depends further on the equities of the case . . . " *Lawrence v. Chater*, 516 U.S. at 167-68. Here, the equities necessarily call for a GVR order. The Federal Circuit has been sharply divided in its approach to claim construction, especially "in recent decisions." *See Phillips v. AWH Corp.*, 363 F.3d at

1216 (Dyk, J., dissenting). Here, instead of settling the issues, the Federal Circuit improperly limited a claim term, overturned the jury's verdict, and created an ambiguous doctrine called "specification estoppel." Only one week later, *Phillips* was decided on the same issues and the same mistakes were made. Now that an *en banc* rehearing will take place, all cases currently pending in the Federal Circuit will be afforded the opportunity to be decided under the new precedent determined in *Phillips*. This case should not be precluded from rehearing and possible reinstatement of the jury verdict. It otherwise would suffer a different outcome from *Phillips* and all other cases currently pending in the Federal Circuit, merely because the opinion in this case issued a week prior to *Phillips*.

This case meets this Court's reasonable standard requirement for a GVR order. The equities require it. As a matter of judicial economy and fairness, the Federal Circuit should consider this case in tandem with *Phillips* because both cases present the same legal issues and having both will afford the Federal Circuit the ability to consider different presentations of the same concerns, while at the same time offering an opportunity to harmonize its decisions once the rule of law is announced by the *en banc* court. Moreover, it would be unreasonable and unjust to deny Dr. Gaus the opportunity to have his case reconsidered in light of the forthcoming precedent of the Federal Circuit based upon the fortuitous passage of only seven days. No harm can come from a GVR order, other than ensuring that similar cases are decided consistently. "Equal Justice Under Law" requires it.

B. The *Phillips* Panel Decision Has Been Vacated Pending Rehearing *En Banc* On Issues That Will Determine The Outcome Of This Case.

On rehearing of *Phillips en banc*, three of the seven questions presented are:

1. Is the public notice function of patent claims better served by referencing primarily to technical and general purpose dictionaries and similar sources to interpret a claim term or by looking primarily to the patentee's use of the term in the specification?

2. If dictionaries should serve as the primary source for claim interpretation, should the specification limit the full scope of claim language (as defined by the dictionaries) only when the patentee has acted as his own lexicographer or when the specification reflects a clear disclaimer of claim scope? If so, what language in the specification will satisfy those conditions? What use should be made of general as opposed to technical dictionaries? How does the concept of ordinary meaning apply if there are multiple dictionary definitions of the same term? If the dictionary provides multiple potentially applicable definitions for a term, is it appropriate to look to the specification to determine what definition or definitions should apply?

. . .

7. Consistent with the Supreme Court's decision in *Markman v. Westview Instr., Inc.*, 517 U.S. 370 (1996), and our *en banc* decision in *Cybor Corp. v. FAS Tech., Inc.*, 138 F.3d 1448 (Fed. Cir. 1998), is it appropriate for this court to accord any deference to any aspect to trial court claim construction ruling? If so, on what aspects, in what circumstances, and to what extent?

Phillips v. AWH Corp., __ F.3d __, 2004 U.S. App. LEXIS 15065, *2-4 (July 21, 2004). A105-106. These issues are precisely those that proved dispositive in the present case. Here, the Federal Circuit never consulted a dictionary to

determine the plain and ordinary meaning of the claim term "pair." A2-14. The *en banc* rehearing will create new precedent for the Federal Circuit related to the proper use of specification language in claim construction, and the level of deference appropriate to trial court claim construction. The answer to these issues likely will compel a different result in this case.

C. The Forthcoming *En Banc* Decision May Compel Upholding The Jury Verdict In This Case.

The grant of rehearing *en banc* constitutes a legal development that may decide this case in favor of Gaus. In *Phillips*, the panel effectively limited the claims of the patent to one of several preferred embodiments, in spite of the lower court's construction of the plain meaning of the claim term at issue and the parties' stipulation thereto. *Phillips v. AWH Corp.*, 363 F.3d at 1212-1214. The panel concluded that the patent specification's "explicit descriptions of the invention" compelled a limited interpretation of a claim term. *Id.* In turn, this interpretation precluded any finding of infringement. *Id.*

The dissent in *Phillips* pointed out that the decision "effectively limits the claims to the preferred embodiment, contrary to our recent decision in *Liebel-Flarsheim Co. v. Medrad, Inc.* [citation omitted] and numerous other decisions of this court. In doing so, the majority decision attempts to work a major and unfortunate change in our recent claim construction jurisprudence." *Id.* at 1216 (Dyk, J., dissenting). The Federal Circuit acknowledged the problem that the dissent pointed out in *Phillips* and granted an *en banc* rehearing to clarify issues of claim construction methodology.

Only seven days before the *Phillips* case, the panel here did exactly what Judge Dyk complained of: it disregarded the district court's construction of the plain meaning of the claim term "pair," and limited the term solely based upon selected descriptions of a preferred embodiment.

A7-14. Now the Federal Circuit has agreed to rehear the *Phillips* case, recognizing that its approach to claim construction warrants the scrutiny and consideration of the *en banc* court. The decision rendered by the Federal Circuit in *Phillips* will determine the outcome in this case. Accordingly, at a minimum, the Court should grant *certiorari*, vacate and remand this case to be evaluated by the Federal Circuit in light of the forthcoming *Phillips en banc* decision.

CONCLUSION

For the foregoing reasons, Petitioner Dr. Harry Gaus prays for issuance of a writ of *certiorari* to the United States Court of Appeals for the Federal Circuit.

Dated: August 3, 2004.

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United States Court of Appeals for the Federal Circuit

03-1295,-1310

DR. HARRY GAUS,

Plaintiff-Cross Appellant,

v.

CONAIR CORPORATION,

Defendant-Appellant.

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Appealed from: United States District Court for the Southern District of New York

Magistrate Judge Frank Maas

United States Court of Appeals for the Federal Circuit

03-1295,-1310

DR. HARRY GAUS,

Plaintiff-Cross Appellant,

v.

CONAIR CORPORATION,

Defendant Appellant.

DECIDED: April 1, 2004

Before RADER, BRYSON, and DYK, Circuit Judges.

BRYSON, Circuit Judge.

Dr. Harry Gaus filed this patent infringement action in the United States District Court for the Southern District of New York, No. 94 Civ. 5693, alleging that certain of Conair Corporation's hairdryers infringed his patent, U.S. Patent No. 4,589,047 ("the '047 patent"). The district court granted Conair's motion for summary judgment that Conair's devices did not literally infringe the '047 patent, but it denied Conair's request for summary judgment of noninfringement under the doctrine of equivalents. The case was then tried to a jury, which found that Conair infringed Dr. Gaus's patent under the doctrine of equivalents and that the infringement was willful. The jury awarded Dr. Gaus $28.5 million in compensatory damages, and the district court enhanced that award by $8,550,000 because of Conair's willfulness. We hold that as a matter of law Dr. Gaus's patent did not cover the Conair

device, either literally or under the doctrine of equivalents, and we therefore reverse the judgment against Conair.

I

The '047 patent is directed to a safety mechanism that prevents fatal shocks to users of electrical appliances such as hairdryers. In the case of a hairdryer, the patented mechanism works by disconnecting the hairdryer from its power source when the hairdryer comes into contact with water. In an unprotected device, if water contacts a voltage-carrying element, such as a hairdryer heating coil or blower, a fatal electric shock can be carried through the water to the user of the device.

The patent describes protective circuitry that includes "a pair of spaced-apart electrically exposed conductive probe networks." When there is no water between the two probe networks, no current flows through the protective circuitry. When water is present, however, the impedance between the probe networks is lowered, and current passes through the protective circuitry. When that occurs, the current melts a resistance element (essentially a fuse). When the resistance element melts, current stops flowing to the voltage-carrying portions of the device, such as the blower and heater of the hairdryer, and the user receives no shock.

The protective circuitry in the accused Conair hairdryer does not include a pair of probe networks separate from the voltage-carrying operating unit of the appliance (in a hairdryer, the heater and blower). Instead, the Conair device has a single sense wire that branches throughout the housing near the voltage-carrying operating elements of the device. When water is disposed between the sense wire and the electrical operating portion of the device, the impedance between the sense wire and the electrical operating portion is lowered. The low impedance causes current to flow through

the protective circuit, which in turn causes the device to be disconnected from the power supply.

In its motion for summary judgment of noninfringement, Conair argued that its accused hairdryer did not contain "a pair of spaced-apart electrically exposed conductive probe networks," as required by the asserted claim, claim 12 of the '047 patent. Conair argued that the protective circuit in its hairdryer included only a single sense wire, rather than a pair of probes, and that its protective system was triggered when current passed between the single sense wire and the voltage-carrying components of the hairdryer, rather than when current passed between the two components of the pair of probe networks recited by the claim. Conair also argued that the patent required that all of the protective circuitry be included within the housing of the hairdryer, while some of the protective circuitry of the accused product was located in the wall plug. The district court agreed that the patent required that all of the protective circuitry be located within the housing and granted summary judgment of no literal infringement on that ground.[1] The court, however, did not agree with Conair on the "pair of . . . probe networks" limitation, and it held that Conair was not entitled to summary judgment of noninfringement under the doctrine of equivalents.

The case proceeded to trial on a theory of infringement under the doctrine of equivalents. At the close of the evidence, Conair moved under Federal Rule of Civil Procedure 50(a) for judgment of noninfringement as a matter of law. In what it characterized as an abbreviated summary of

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[1] Because we hold that Conair's accused device did not infringe based on the absence of a "pair of spaced-apart electrically exposed conductive probe networks," we do not decide whether the patent requires that all of the protective circuitry be located within the hairdryer housing.

its grounds for relief, Conair argued, inter alia, that there was no infringement based on the "all elements rule" and "specification estoppel." The district court denied Conair's motion, and the case went to the jury. Following the jury's verdict, Conair renewed its motion, which was again denied.

II

Conair argues that claim 12 of the '047 patent requires that the device contain a "pair of . . . probe networks" that is separate from its voltage-carrying operating portions. The Conair hairdryer does not infringe, according to Conair, because the protective system in its hairdryer has only a single probe, which functions in conjunction with the voltage-carrying operating portion of the hairdryer, not in conjunction with a second element of a pair of probes. Conair contends that the '047 patent disclaims a protective system such as Conair's and that Conair's hairdryer therefore does not infringe, either literally or under the doctrine of equivalents.

In pertinent part, claim 12 recites the following:

> A hazard prevention device for an electrical externally powered apparatus comprising:
>
> > a housing, said housing having at least one opening and said housing comprising an electrical operating unit and a pair of spaced-apart electrically exposed conductive probe networks, said pair being responsive to the entry of a conductive fluid electrically reducing the impedance between said probe networks of said pair . . . .

A

Preliminarily, Dr. Gaus argues that Conair waived any challenge to the jury's verdict of infringement under the doctrine of equivalents by failing to challenge the sufficiency of the evidence with the requisite specificity in its preverdict Rule 50(a) motion. Citing Duro-Last, Inc. v. Custom Seal, Inc., 321 F.3d 1098, 1105 (Fed. Cir. 2003), Dr. Gaus asserts that simply listing the grounds on which Conair based its Rule 50(a) motion was insufficient to put Dr. Gaus on notice as to what Conair alleged to be deficient in Dr. Gaus's evidence.

The district court, which was in the best position to judge the sufficiency of the Rule 50(a) motion in the context of the trial, held that the motion was sufficient, particularly in light of the fact that "liability under the doctrine of equivalents has been the central issue in this case since [the district court] determined . . . that Gaus' patent was not literally infringed." We decline to upset that determination. While the references to the "all elements" rule and "specification estoppel" constituted a terse-even cryptic-statement of the grounds for Conair's motion for a judgment of noninfringement as a matter of law, we are not persuaded that those references were inadequate to apprise Dr. Gaus of the grounds on which Conair was basing its motion.

In its post-trial motion for judgment as a matter of law, Conair argued, inter alia, that the Conair device lacked one of the limitations set forth in the asserted claim-the pair of conductive probe networks-and that the specification made clear that the invention did not encompass structure such as that found in Conair's device. Those are the same arguments that Conair raised in its Rule 50(a) motion, albeit in abbreviated form. Under these circumstances, we are not disposed to override the district court's determination that Conair did not waive its noninfringement claim by failing to

make an adequate Rule 50(a) motion at the close of the evidence.

Dr. Gaus also argues that Conair urged a new claim construction for the first time after trial and on appeal. Dr. Gaus contends that Conair did not make the argument earlier and therefore has waived it. We disagree with the premise of Dr. Gaus's argument, however. Before trial, Conair argued that the "pair of probe networks" limitation should be construed to require

> two corresponding things designed for use together the functioning of which are independent of the other voltage carrying portions of the hairdryer to be protected and which are configured such that the trigger switch current will respond before the penetrating water reaches any other voltage carrying portions of the hairdryer, such as the heating coil.

After trial and on appeal, Conair has argued that the pair of probe networks must be construed to mean "a pair of probe networks that is separate and operates independently from any voltage carrying part of the apparatus and which will effect a current shut off (upon entry of water) before water touches any voltage carrying part of the apparatus." While the two formulations employ somewhat different language, they embody the same concept-that the probe network must contain two conductive elements that are separate or independent from the voltage-carrying portions of the hairdryer. We find no change of position on Conair's part, and thus no waiver.

B

Turning to the merits, we focus on the critical claim language, which provides that the housing of the claimed apparatus comprises "an electrical operating unit and a pair of

spaced-apart electrically exposed conductive probe networks." The claim lists the "electrical operating unit" separately from the "pair of spaced-apart electrically exposed conductive probe networks," and does not suggest that the "pair of . . . probe networks" consists in part of a portion of the "electrical operating unit." Rather, the clear implication of the claim language is that the pair of probe networks is a distinct component, separate from the electrical operating unit of the claimed invention.

The specification confirms that interpretation.[2] The specification refers to the "electrical operating unit" variously as the "voltage-carrying exposed parts" of the device, '047 patent, col. 3, l. 41, the "interior part of the apparatus carrying a voltage," id., col. 5, ll. 61-62, the "other parts of the electrical apparatus which have a voltage on them, e.g., the heating coil in the case of a hairdryer," id., col. 7, ll. 1-2, or the "voltage-carrying parts of the apparatus," id., col. 7, ll. 10-11. The "pair of spaced-apart electrically exposed conductive probe networks" is described in the specification as an "exposed electrical double conductor," id., col. 3, ll. 5-6, and a "probe in the form of a double conductor," id., col. 3, l. 20; col. 5, l. 40; col. 6, l. 66; col. 7, ll. 9-10. Nothing in the descriptions of those two components suggests that their structures or functions overlap. To the contrary, the specification plainly describes the two components as separate.

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[2] Indeed, as we discuss below, even if the claim language itself did not support the interpretation we adopt, there is in the specification "a clear case of disclaimer of subject matter that, absent the disclaimer, could have been considered to fall within the scope of the claim language." SciMed Life Sys., Inc. v. Advanced Cardiovascular Sys., Inc., 242 F.3d 1337, 1344 (Fed. Cir. 2001); accord Liebel-Flarsheim Co. v. Medrad, Inc., 358 F.3d 898, 906-09 (Fed. Cir. 2004).

The Summary of the Invention describes the exposed electrical double conductor and the protective circuit that is wired to it as triggering the disconnection of the power to the appliance as soon as "a conductive fluid such as water penetrates into the apparatus housing." '047 patent, col. 3, ll. 34-39. The device "accomplishes this disconnection," according to the Summary, "before the user can be connected to voltage-carrying exposed parts via the fluid which has entered the housing." Id., col. 3, ll. 39-42. That description plainly contemplates that the double conductor is separate from the voltage-carrying electrical operating unit, a structural separation that is essential to the operation of the device in the prescribed manner.

The specification explains that the "electrical double conductor of the probe" may be configured in the form of strips placed near the areas of the housing to which water might have access, so that "water which penetrates through the opening or through the gap in the housing cannot produce an electrical contact forming a current path from any interior part of the apparatus carrying a voltage to any point lying outward of such interior part, without said water wetting the strips." '047 patent, col. 5, ll. 58-63. Elsewhere, the specification makes the same point, directing that the "electrical double conductor of the probe should be configured in such a way that the trigger switch circuit will respond before the penetrating water reaches any other parts of the electrical apparatus which have a voltage on them (e.g., the heating coil, in the case of a hairdryer)." Id., col. 6, l. 66, through col. 7, l. 3.

The specification further describes how far the probes must be separated from the electrical operating system to avoid any water contacting the electrical operating system before the power has been disconnected. For example, in the case of a protective switch with a tripping speed of 1.3 milliseconds, the specification explains that the minimum

distance between the electrical double conductor of the probe and the voltage-carrying parts of the apparatus must be 10 millimeters. '047 patent, col. 7, ll. 7-11. By separating the pair of probe networks from the voltage-carrying components of the device by that amount, the invention ensures that the protective circuit will have time to cut the power to the apparatus before the water reaches the voltage-carrying components.

Moreover, the specification explains that "[t]he object of the invention is to devise a protective device . . . which device will respond in an extremely short time independently of the operating state of the apparatus, so as to protect the user from electric shock." 47 patent, col. 2, ll. 55-61 (emphasis added). The invention therefore cannot encompass a hairdryer with a protective device that relies on current passing between a probe and the electrical operating system, since such a device would be triggered only when the hair dryer was operating and voltage was being applied to the electrical operating system. The specification thus plainly requires that the pair of probe networks be separate from the voltage-carrying electrical operating unit of the device, such as (in the case of a hairdryer) the heating coil and the blower.

Significantly, the specification describes one of the principal advantages of the claimed invention in a way that excludes the electrical operating unit from serving as part of the pair of probe networks. The specification explains that prior art devices would trigger the protective circuit only when there was a direct connection between the water and the power supply circuit, which would result in a shock of at least brief (and thus, ideally, nonlethal) duration to the user of the device. '047 patent, col. 2, ll. 13-20. The specification adds, however, that the invention of the '047 patent protects the user from such a shock; see id., col. 2, ll. 55-61, and the specification explains that the invention does so by arranging for the protective circuit to be separate from the voltage-

carrying components of the appliance. The invention achieves that objective because it ensures that water will encounter the two probe networks before it encounters the voltage-carrying electrical operating unit. The lowering of impedance between the two probe conductors caused by the entry of water into the housing triggers the flow of electricity through a circuit that cuts power to the entire apparatus within milliseconds. Because of the presence of large resistors in the protective circuit, the leakage of current from the protective circuit, when it is triggered, is very low and completely safe-approximately 1.8 milliamperes, according to the specification. Id., col. 5, ll. 32-34. For that reason if, for example, a bather drops a hairdryer into the bath water, the claimed invention will interrupt the power to the hairdryer before the bather feels any shock.

Dr. Gaus argues that the specification's discussion of a protective device that prevents the user from being connected to the electrical operating unit via the fluid is merely a description of a preferred embodiment. The specification, however, states that "according to the invention" the protective circuit "accomplishes this disconnection before the user can be connected to voltage-carrying exposed parts via the fluid which has entered the housing." '047 patent, col. 3, ll. 34-42. The specification thus demonstrates that the invention itself requires that the user be completely protected from shock, in contrast to prior art devices that exposed the user to a brief, non-lethal shock.

The Conair device operates in an entirely different way. The undisputed evidence showed that in the Conair device the protective circuit is not triggered until water reaches a voltage-carrying component and creates an electrical connection between that component and the sense wire, at which point current runs between the voltage-carrying component and the sense wire, triggering the protective circuit that shuts off the power to the device.

During the short period before the power shuts off, the user of the device will experience a shock, although because the period of the current flow is very short, the shock is not fatal.

In sum, Conair's hairdryer does not have a pair of probe networks that is separate from the electrical operating unit, as is required by claim 12 of the '047 patent. Rather, the Conair device employs a single probe acting in concert with the electrical operating system. Conair's hairdryer therefore does not literally infringe claim 12 of the '047 patent.

C

Dr. Gaus argues that even assuming the district court was correct in ruling that there was no literal infringement in this case, the jury had before it ample evidence from which to conclude that the structure of the protective system in Conair's hairdryer had structure that was equivalent to the "pair of . . . probe networks" and that the court was correct to enter judgment on the jury verdict of infringement under the doctrine of equivalents.[3] We hold that because the patent made clear that structure such as that in the Conair device was excluded from the scope of the claimed invention, the

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[3] In addition to his own testimony and that of his expert that a sense wire paired with the electrical operating system is insubstantially different from the claimed structure, Dr. Gaus points to alleged admissions on the part of Conair's expert and a Conair senior project engineer that Conair's device must have a pair of probe networks in order to work. Those "admissions," however, amounted to nothing more than acknowledgements that a wire attached to the electrical operating system would be at the same potential as the operating system, and that the sense wire cannot function without current flowing to it from another point, such as the electrical operating system.

district court should have granted judgment of noninfringement as a matter of law.

Dr. Gaus characterizes the issue as being whether Conair's hairdryer can infringe under the doctrine of equivalents, even though its electrical operating system performs the functions of two claim elements. That, however, is not the issue as we see it. It is true, as Dr. Gaus argues, that "[e]quivalency can . . . exist when separate claim limitations are combined into a single component of the accused device." Dolly, Inc. v. Spalding & Evenflo Cos., 16 F.3d 394, 399 (Fed. Cir. 1994). However, the problem for Dr. Gaus in this case is that the '047 patent excluded structure of the sort found in Conair's hairdryers as being outside the scope of Dr. Gaus's invention.

As this court has explained, "[a] particular structure can be deemed outside the reach of the doctrine of equivalents because that structure is clearly excluded from the claims whether the exclusion is express or implied." SciMed Life Sys., Inc. v. Advanced Cardiovascular Sys., Inc., 242 F.3d 1337, 1345 (Fed. Cir. 2001); accord Dolly, 16 F.3d at 400 ("In short, the concept of equivalency cannot embrace a structure that is specifically excluded from the scope of the claims."); Moore U.S.A., Inc. v. Standard Register Co., 229 F.3d 1091, 1106 (Fed. Cir. 2000) (claim limitation requiring a "majority" cannot be equivalent to a "minority," its antithesis); Athletic Alternatives, Inc. v. Prince Mfg., Inc., 73 F.3d 1573, 1582 (Fed. Cir. 1996). In SciMed, the patentee "specifically identified, criticized, and disclaimed" a dual lumen catheter in the patent specification, and accordingly was barred from invoking the doctrine of equivalents to recapture the dual lumen catheter. 242 F.3d at 1345. Similarly, in Dolly, because the claim itself specifically required a portable adjustable child's chair with a stable rigid frame formed of components other than the seat and back panels, the court held that the patentee could not rely on the

doctrine of equivalents to cover a chair with a stable rigid frame formed of the seat and side and back panels. 16 F.3d at 399.

In the specification of the '047 patent, Dr. Gaus criticized prior art in which the protective device relied on the fluid coming in contact with the voltage-carrying portions of the system, '047 patent, col. 2, ll. 13-20, and indicated that his invention avoids the resulting problem, an electric shock to the user, id., col. 3, ll. 34-42. Likewise, Dr. Gaus described the invention as requiring the protective circuitry to function regardless of the operating state of the apparatus, id., col. 2, ll. 55-61, something that the Conair device could not do, because of its reliance on the voltage-carrying operating unit of the hairdryer to serve as one of the two conductors in the protective circuit. Dr. Gaus thus made clear that it is essential to his invention that the pair of probe networks be separate from the voltage-carrying components of the appliance, i.e., the "electrical operating system."

Having disavowed coverage of devices in which the two components are not separate and in which the protective cut-off mechanism is not triggered until the water reaches the electrical operating system, the patentee cannot reclaim that surrendered claim coverage by invoking the doctrine of equivalents. See Dawn Equip. Co. v. Ky. Farms Inc., 140 F.3d 1009, 1016-17 (Fed. Cir. 1998) (criticism in patent of prior art structure, which is similar to structure of accused device, supports conclusion of non-equivalence). We therefore hold that the evidence does not support Dr. Gaus's contention that Conair infringes the '047 patent under the doctrine of equivalents. Accordingly, the district court should have granted Conair's motion for judgment of non infringement as a matter of law.

REVERSED

UNITED STATES DISTRICT COURT
SOUTHERN DISTRICT OF NEW YORK

HARRY GAUS,	:	
Plaintiff,	:	**JUDGMENT**
-against-	:	94 Civ. 5693 (FM)
CONAIR CORPORATION,	:	
Defendant.	:	

FRANK MAAS, United States Magistrate Judge.

WHEREAS, this action came on for trial before the undersigned and a duly empaneled jury on January 22, 2002; and

WHEREAS, the jury rendered a verdict on February 1, 2002 finding that: (a) the defendant Conair Corporation ("Conair") infringed Claim 12 of United States Patent No. 4,589,047 (the"'047 Patent"); (b) the '047 Patent was valid; (c) Conair's infringement of the '047 Patent was willful; and (d) Dr. Harry Gaus ("Gaus") was entitled to twenty-eight million five hundred thousand dollars ($28,500,000) in compensatory damages from Conair as a result of such infringement; and

WHEREAS, the parties filed post-trial motions which the Court determined in its Orders dated January 31, 2003 and February 14, 2003;

NOW THEREFORE, IT IS HEREBY ORDERED, ADJUDGED, AND DECREED that:

1. Judgment be entered against Conair Corporation ("Conair") and in favor of Dr. Harry Gaus ("Gaus") in the amount of $28,500,000 in compensatory damages, $9,095,579 in prejudgment interest, and $8,550,00 in enhanced damages, for a total judgment of $46,145,579, said judgment to be effective as of February 14, 2003.

2. Conair and its officers, agents, servants, employees, and attorneys, and those persons who are in active concert or participation with them and who receive actual notice of the Opinion and Order, or this Judgment, are hereby enjoined from making, using, offering to sell, selling, or importing into the United States all products having the nonresettable IDCI device licensed to Conair by Leviton that was the subject of this lawsuit.

3. Enforcement of this Judgment shall be stayed for a period of ten days to permit Conair to post a supersedeas bond, letter of credit, or combination of the two, in an amount totaling $28,500,000. If such security is furnished, the Court will thereafter enter a stay pursuant to Federal Rule of Civil Procedure 62(d), provided that Conair furnishes to Gaus's counsel on a confidential basis with copies of (a) its Form 10Ks within ten days after they are issued; (b) its audited yearly financial statements within ten days after they are finalized; and (c) the monthly unaudited financial statements and quarterly unaudited financial statements and certifications that Conair provides to its banks on the same day that they are sent to the banks. If this documentation (or information received from any other source) suggests that there has been a material adverse change in Conair's financial condition, Gaus may apply to the Court at any time for additional security.

THIS JUDGMENT IS A FINAL AND
APPEALABLE ORDER.

Dated: New York, New York
March 3, 2003

s/
FRANK MASS
United States Magistrate Judge

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UNITED STATES DISTRICT COURT
SOUTHERN DISTRICT OF NEW YORK

HARRY GAUS, :

Plaintiff, : **OPINION AND ORDER**

-against- : 94 Civ. 5693 (FM)

CONAIR CORPORATION, :

Defendant. :

FRANK MAAS, United States Magistrate Judge.

I. Introduction

This patent infringement suit was brought by Dr. Harry Gaus ("Gaus"), a German inventor, against the Conair Corporation ("Conair"). Following a two-week trial in early January 2002, and several hours of deliberations, the jury returned a verdict in favor of Gaus in the amount of $28.5 million.

Conair has now moved for judgment as a matter of law ("JMOL") under Rule 50(b), or, in the alternative, a new trial under Rule 59, of the Federal Rules of Civil Procedure. Gaus has cross-moved for enhanced damages, prejudgment interest, attorney's fees, and injunctive relief. As set forth below, Gaus's motions are granted in part and denied in part, and Conair's motions are denied. Additionally, the Clerk of the Court is directed to enter a judgment against Conair consistent with this Opinion and Order and close this case.

II. Background

This action arises out of Conair's sale of hair dryers containing a nonresettable device intended to stop the flow of electricity if the dryers become immersed in water. In his complaint, Gaus contends that the accused Conair hair dryers infringed his U.S. Patent No. 4,589,047 (the "`047 Patent" or "Gaus Patent"), entitled "Protective Mechanism In Electrically Operated Devices."

Prior to trial, the Court denied, on various grounds, three motions by Conair seeking summary judgment. See Gaus v. Conair Corp., 2002 WL 15647 (S.D.N.Y. Jan. 4, 2002)(Maas, Mag. J.)("Conair III"); Gaus v. Conair Corp., 1999 WL 945519 (S.D.N.Y. Oct. 18, 1999)(Duffy, J.)("Conair II"); and Gaus v. Conair Corp., 1998 WL 92430 (S.D.N.Y. March 3, 1998)(Duffy, J.)("Conair I"). Familiarity with the facts and these prior decisions is assumed.

III. Discussion

A. Rule 50(b) Motion

1. Applicable Law

Rule 50(b) provides that a party may renew after trial a JMOL motion made pursuant to Rule 50(a) before the case was submitted to the jury. Fed. R. Civ. P. 50(b). In turn, Rule 50(a) requires that such a motion "specify the judgment sought and the law and the facts on which the moving party is entitled to the judgment." Fed. R. Civ. P. 50(a)(emphasis added).

Trial and appellate courts apply the same standard in reviewing a post-trial JMOL motion. DiSanto v. McGraw-Hill, Inc./Platt's Div., 220 F.3d 61, 64 (2d Cir. 2000). Pursuant to that standard, a movant seeking to set aside a jury verdict faces "a high bar." Lavin McEleney v. Marist College, 239 F.3d 476, 479 (2d Cir. 2001). As the Second Circuit has cautioned:

> In deciding such a motion, the court must give deference to all credibility determinations and reasonable inferences of the jury, and it may not itself weigh the credibility of witnesses or consider the weight of the evidence. Thus, judgment as a matter of law should not be granted unless
>
> > (1) there is such a complete absence of evidence supporting the verdict that the jury's findings could only have been the result of sheer surmise and conjecture, or
> >
> > (2) there is such an overwhelming amount of evidence in favor of the movant that reasonable and fair minded [persons] could not arrive at a verdict against [it].

DiSanto, 220 F.3d at 64 (quoting Galdieri-Ambrosini v. Nat'l Realty & Dev. Corp., 136 F.3d 276, 289 (2d Cir. 1998)).

2. Compliance with the Rule

Before turning to the merits of Conair's motion, the Court must consider whether Conair has complied with the specificity requirement of Rule 50(a). During the trial, Conair made its JMOL motion at the close of Gaus's direct case and properly renewed it at the close of the evidence and after the jury returned its verdict. As part of these applications, Conair's counsel identified, in summary fashion, five alleged

grounds for relief: (a) Gaus's failure to disclose the "best mode" for practicing his invention; (b) Gaus's failure to comply with the "all elements rule;" (c) Gaus's failure to specify the location of the device, which Conair contends is an essential element of his invention; (d) "defenses in connection with specification estoppel;" and (e) anticipation and obviousness. (Tr. 830-32, 1456-58, 1614).

In its post-trial JMOL motion papers, in addition to these grounds, Conair seeks to overturn the jury's special verdicts relating to damages, wilfulness, and the doctrine of equivalents. (Conair JMOL Mem. at 1-2). Gaus contends that Conair has waived the right to rely on these grounds as bases for its JMOL motion because they were not specifically identified at trial. (Gaus JMOL Mem. at 3-4).

"[T]he purposes of the specificity requirement 'are twofold: (1) to assure that the trial court has an adequate basis for its decision; and (2) to afford the adverse party the opportunity to correct any possible infirmities in the proof submitted.'" Gordon v. County of Rockland, 110 F.3d 886, 887-88 n.2 (2d Cir. 1997)(quoting 5A Moore's Federal Practice ¶50.04); see also Lambert v. Genesee Hosp., 10 F.3d 46, 54 (2d Cir. 1993)("the specificity requirement is obligatory and ensures that the other party is made aware of the deficiencies in proof that may have been overlooked"). Thus, a party is generally precluded from filing a post-trial JMOL motion on a ground not asserted prior to verdict. See Doctor's Assocs., Inc. v. Weible, 92 F.3d 108, 112 (2d Cir. 1996).

However, denial of a motion for JMOL is not always appropriate simply because the grounds set forth in a post-trial motion are more expansive than those advanced during the trial. For example, in Gordon, an additional issue was raised by the district judge, rather than the defendant, during the Rule 50(a) colloquy. Gordon, 110 F.3d at 887-88 n.2. The

Second Circuit nevertheless rejected an attempt to construe Rule 50 narrowly because both sides "were well aware" of the issue both before and during the trial. Id.

Similarly, in this case, Gaus can scarcely claim to have been blindsided by Conair's post-trial arguments with respect to the doctrine of equivalents. Indeed, Conair's liability under the doctrine of equivalents has been the central issue in this case since Judge Duffy determined in Conair I that Gaus's patent was not literally infringed. Also, although Conair did not specifically cite the doctrine of equivalents during the trial as the basis for its Rule 50 motion, it did challenge the adequacy of the proof under the related "all elements rule." Accordingly, because Gaus must have been fully aware of Conair's intent to rely on the doctrine of equivalents as a basis for its JMOL motion, I decline to find that this ground for JMOL has been waived.

Turning to damages and wilfulness, Gaus is correct that Conair failed to preserve its objection with respect to these issues. In Cruz v. Local Union No. 3 IBEW, 34 F.3d 1148, 1155 (2d Cir. 1994), the Second Circuit held that a defendant who fails to raise the issue of damages in its JMOL motion during trial cannot later complain about the jury's findings regarding that issue. Additionally, the court rejected the defendant's claim that post-trial review of a jury's damages award cannot be waived during a trial because the sufficiency of the evidence underlying the jury's award cannot realistically be evaluated until the verdict is rendered. As the court observed, at the point that the defendant made its Rule 50 motion at trial it "was aware of the proof submitted on the issue of damages" and therefore could have questioned its sufficiency. Id.

At trial, Conair's initial Rule 50 motion was made immediately after Gaus's economics expert testified about the extent of Gaus's monetary damages. By that time, as in Cruz,

Conair was fully aware of Gaus's proof with respect to the issue of damages and could have challenged its sufficiency in the JMOL motions it made during trial. Gaus also had devoted much of his direct case to proving wilfulness on the part of Conair. Nevertheless, despite that focus, Conair failed to voice any complaints about the adequacy of Gaus's proof of wilfulness in its Rule 50 motions at trial. See Nestier Corp. v. Menasha Corp.-Lewisystems Div., 739 F.2d 1576, 1580 (Fed. Cir. 1984)(declining to review the jury's findings with respect to wilfulness in light of the appellant's failure to list it as a ground for relief at the close of all the evidence).

Accordingly, on this record, the Court could treat the sufficiency of Gaus's evidence with respect to wilfulness and damages as issues which were waived by Conair's failure to raise them prior to the jury's verdict. I am mindful, however, that the jury's damages award - even in the absence of any enhancement for wilfulness – is exceptionally large. See Jerry Markon, Conair Faces Hair-Raising Damage Award, The Wall Street Journal, Mar. 19, 2002, at B1 (noting that the Gaus verdict, if trebled, "would be one of the largest damage awards in recent years in [the patent field]"). Accordingly, I have chosen to address each of the issues raised in Conair's post-trial briefing concerning its Rule 50 motion. See Baskin v. Hawley, 807 F.2d 1120, 1134 (2d Cir. 1986)(court may consider any issue raised in a JMOL motion if necessary to "prevent manifest injustice"). Gaus can claim no prejudice as a consequence of this review because, as shown below, the evidence at trial with respect to the contested issues of damages and wilfulness was more than sufficient to support the jury's verdict.

3. Doctrine of Equivalents

In Conair I, Judge Duffy granted Conair partial summary judgment with respect to Claim 12 of the Gaus Patent, finding that the "housing" limitation of that claim was

not literally infringed. Nevertheless, Judge Duffy permitted the case to move forward under the doctrine of equivalents based upon his finding that "Gaus has met his required burden and shown through his expert that material issues of disputed fact exist as to not only the structure of Conair's device but also to its function." Conair I, 1998 WL 92430, at *4. Although the same expert testified on Gaus's behalf at trial, Conair continues to maintain that the evidence before the jury did not permit a reasonable juror to find liability under the doctrine of equivalents.

The doctrine of equivalents requires an element-by-element comparison of the claims of the patented invention to the accused device. See Kahn v. Gen. Motors Corp., 135 F.3d 1472, 1478 (Fed. Cir. 1998). Essentially, the finder of fact is asked to consider whether every limitation of the disputed claim has a substantially equivalent element in the accused product. Id. The patent holder must establish that, with respect to each disputed element, the accused product performs "substantially the same function, in substantially the same way, to give substantially the same result." Conair I, 1998 WL 92430, at *3 (quoting Hormone Research Found., Inc. v. Genentech, Inc., 904 F.2d 1558, 1564 (Fed. Cir. 1990)). Accord Overhead Door Corp. v. Chamberlain Group, Inc., 194 F.2d 1261, 1270 (Fed. Cir. 1999).

At trial, Dr. LeRoy Silva, a retired professor of electrical engineering, testified on behalf of Gaus that each of the three disputed limitations of Claim 12 of the `047 Patent was present, either literally or under the doctrine of equivalents, in the accused Conair hair dryers. First, with respect to the housing limitation of Claim 12, Dr. Silva testified that the housing in the Conair device, which is unitary with the power cord, served substantially the same function, in substantially the same way, with substantially the same result as the housing encasing the electric components and switching arrangement in the patented invention. (Tr.

609-11). Dr. Silva further testified that the R-3 resistor in the accused device would be considered a "fusible member" by one skilled in the relevant art and the substantial equivalent of the "fusible electrically conductive member" described in Claim 12 of the Gaus Patent. (Id. at 597-602). As he explained, the introduction of water into both the patented invention and the Conair hair dryers would generate a current that caused the fusible member to explode. (Id. at 597-98). This, in turn, would allow contacts which were normally closed to open in both the claimed invention and the accused device. (Id. at 598-99). Finally, Dr. Silva testified that Conair's accused devices contain the substantial equivalent of a "pair of spaced-apart electrically-exposed conductive probe networks" because Claim 12 imposes no requirement that the pair of networks be independent of the voltage-carrying circuitry. (Id. at 602-03).

Dr. Silva's testimony, if accepted by the jury, was sufficient to sustain the jury's verdict, but it was not the only evidence in the record supporting a claim of infringement by equivalents. Dr. Arden Sher, Conair's own expert and former employee, admitted at trial that the sense wire in Conair's accused device would not function in the intended manner unless it was paired up with (i.e., connected to) the hot phase line. (Id. at 1196). This gave greater credence to Gaus's contention that the Conair device contained the substantial equivalent of the "pair of spaced apart electrically exposed probe networks" limitation found in Claim 12. During his testimony, Dr. Sher also conceded that if the word "pair" in the "pair of probe networks" limitation were construed to mean two corresponding parts used together, as in a "pair of pants," his opinion that this element was not found in the accused device would be undermined. (Id. at 1195-96). This construction, of course, is precisely what Judge Duffy concluded the term "pair" meant when he was asked to construe it in Conair I. See Conair I, 1998 WL 92430, at *3. Richard Shoemaker, a former Conair engineer subpoenaed by

Gaus, also conceded at trial that the hot phase line in the accused Conair hair dryers would be "electrically" the same as a second sense wire if the hot phase line were extended and water then entered the device at that point. (Id. at 420-21).

In sum, the testimony of Dr. Silva, supplemented by this additional testimony, plainly permitted a reasonable juror to find in Gaus's favor with respect to the issue of infringement by equivalents.

4. Damages

At trial, Gaus's economics expert, Geoffrey Osborne, testified, on the basis of his review of extensive Conair records, that Conair sold 77 million infringing hair dryers over a period of approximately nine years. (Id. at 747). Dr. Osborne also testified that a royalty of 37 to 44 cents per unit would have been appropriate for the lawful use of Gaus's invention in those hair dryers. (Id.). In its verdict, the jury awarded Gaus $28,500,000, a sum which it apparently calculated by multiplying 77 million hair dryers by a royalty

of 37 cents per unit. (Id. at 1611). Conair contends that both of these figures are grossly inflated.[1] (Conair JMOL Mem. at 5-13).

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[1] In his post-trial submissions, Gaus challenges Conair's assumption that the jury necessarily adopted his expert's figures in arriving at its verdict. (Gaus JMOL Mem. at 5). The jury could, of course, have applied a higher royalty rate to a smaller number of units to arrive at its award. However, the sale of 77 million infringing units at a royalty rate of 37 cents per unit would result in damages of $28,490,000, a sum which is within $10,000 of the jury's actual award. For that reason, I have adopted Conair's assumptions concerning the basis of the jury's verdict for purposes of the analysis set forth below. Gaus is, of course, entitled to prevail if there is any factual theory supported by the evidence which would have permitted the jury to award him the amount that it did.

a. Number of Units

Dr. Osborne testified that he and his staff reviewed some 42,000 Conair documents in an effort to determine the number of infringing devices sold by Conair. (Tr. 740). Working with the model numbers of the hair dryers identified by Conair as incorporating a nonresettable IDCI,[2] Dr. Osborne at first concluded that Conair had sold a total of 49 million infringing hair dryers. (Id. at 781). Subsequently, through the report of Conair's own damages expert, Dr. Osborne learned that certain model numbers which used the nonresettable IDCI technology had not been included on Conair's original list of its potentially infringing hair dryers. (Id. at 782, 824-25). After incorporating the records regarding these additional models into his calculations, Dr. Osborne concluded that Conair had sold 77 million infringing devices. (Id. at 782-83).

Conair contends that the dramatic increase in Dr. Osborne's estimate of the number of infringing devices sold is the result of inappropriate double counting. (Conair JMOL Mem. at 6-7). At trial, through the testimony of John Mayorek, one of its senior vice-presidents, Conair sought to show that it had at times inventoried under a single model number hair dryers that incorporated more than one type of circuit interruption device. (Tr. 1227-29). As Mayorek explained, as a result of this error, certain of the hair dryers identified on Conair's lists contained a noninfringing

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[2] IDCI refers to an "Immersion Detector Current Interrupter." It is a "device intended to be used with electric appliances and designed to interrupt circuit to the load when an appliance is unintentionally immersed in water." Mark C. Ode, The Differences Between GFCI, IDCI, and GFPE, Electrical Contractor Magazine (Feb. 2001), available at http://www.ul.com/regulators/ode/0201.pdf.

competing technology known as an ALCI.[3] Conair further contended that all of its hair dryers containing nonresettable IDCIs were manufactured in Costa Rica. Accordingly, in its view, Dr. Osborne should have incorporated into his calculations only the considerably smaller number of hair dryers manufactured there. (Id. at 1229-32). Mayorek testified that Conair had manufactured approximately 46 million IDCI plugs in Costa Rica during the relevant time period. (Id. at 1232). Since each infringing device necessarily used an IDCI plug, Mayorek testified - and Conair urged the jury to find - that a maximum of 46 million infringing hair dryers were manufactured. (Id.).

Conair actually made several attempts over time to quantify its sales of hair dryers that employed nonresettable IDCIs. (See Docket No. 76 (Discovery Order dated July 7, 2000)). Eventually, however, Conair concluded that it could not use its own hair dryer inventory records to determine the correct number of units. (Tr. 828-29). Indeed, Richard Margulies, Conair's vice-president and general counsel, conceded in both a pretrial affidavit and at trial that Conair believed that it was impossible to determine the number of potentially infringing hair dryers "with a reasonable degree of ...accuracy without doing the type of cross-checking apparently done by [Gaus]." (Id. at 1278).

On this record, a reasonable juror could have concluded that the correct number of infringing devices was 46 million, or 77 million, or possibly some number in between. Although the jury was not asked to specify the

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[3] ALCI refers to an "Appliance Leakage Current Interrupter." "It is a device intended to be used in conjunction with an electrical appliance and is designed to interrupt the circuit when a ground fault current exceeds 6 milliamps." See Ode, supra.

number of infringing units in its verdict, it appears to have credited Dr. Osborne's revised calculations. (See n.1, supra). This is scarcely surprising since (i) Margulies conceded that Conair could not derive the correct number from its own inventory records without replicating Dr. Osborne's work (Tr. 1278); (ii) Conair did not dispute this aspect of Dr. Osborne's damages calculation during its summation (id. at 1518-46); and (iii) the jury was instructed (without objection) that it had to resolve any doubts as to the extent of Gaus's damages against Conair. (Id. at 1511). This aspect of Conair's Rule 50 motion consequently is meritless.[4]

b. Reasonable Royalty

Conair and Gaus agree that the factors that the jury had to consider in determining the royalty that would have resulted from an arms length negotiation between Gaus and Conair at the outset of Conair's allegedly infringing activities are set forth in Judge Tenney's decision in Georgia-Pacific Corp. v. U.S., 318 F. Supp. 1116 (S.D.N.Y. 1970).[5]

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[4] Conair's papers suggest that Gaus caused the Court to rule erroneously against the admission of a Conair summary exhibit setting forth the number of IDCI plugs manufactured in Costa Rica. (Conair JMOL Mem. at 7-8). In fact, the Court simply requested that the foundation for the admission of the exhibit be supplemented. (Tr. 1232). Thereafter, Conair introduced testimony concerning the number of such plugs without making a further attempt to introduce the summary. (Id. at 1232-38).

[5] These factors are: (1) the royalties received by the patentee for the licensing of the patent in suit, proving or tending to prove an established royalty; (2) the rates paid by the licensee for the use of other patents comparable to the patent in suit; (3) the nature and scope of the license, as exclusive or non-exclusive, or as restricted or non-restricted in terms of

territory or with respect to whom the manufactured product may be sold; (4) the licensor's established policy and marketing program to maintain his patent monopoly by not licensing others to use the invention or by granting licenses under special conditions designed to preserve that monopoly; (5) the commercial relationship between the licensor and licensee, such as, whether they are competitors in the same territory in the same line of business; or whether they are inventor and promoter; (6) the effect of selling the patented specialty in promoting sales of other products of the licensee, that existing value of the invention to the licensor as a generator of sales of his non-patented items, and the extent of such derivative or convoyed sales; (7) the duration of the patent and the term of the license; (8) the established profitability of the product made under the patent; its commercial success; and its current popularity; (9) the utility and advantages of the patent property over the old modes or devices, if any, that had been used for working out similar results; (10) the nature of the patented invention, the character of the commercial embodiment of it as owned and produced by the licensor, and the benefits to those who have used the invention; (11) the extent to which the infringer has made use of the invention, and any evidence probative of the value of that use; (12) the portion of the profit or of the selling price that may be customary in the particular business or in comparable businesses to allow for the use of the invention or analogous inventions; (13) the portion of the realizable profit that should be credited to the invention as distinguished from non-patented elements, the manufacturing process, business risks, or significant features or improvements added by the infringer; (14) the opinion testimony of qualified experts; (15) the amount that a licensor (such as the patentee) and a licensee (such as the infringer) would have agreed upon (at the time the infringement began) if both had been reasonably and voluntarily trying to reach an agreement. Georgia-Pacific, 318 F. Supp. at 1120.

During his direct examination, Dr. Osborne discussed each of those factors, highlighting three reasons why Gaus would have been in a strong negotiating position in 1991. First, Underwriters Laboratories ("UL") had set a January 1, 1991 deadline for the introduction of technology to protect users of hair dryers from electrical shock. (Tr. 496, 509, 772-73, 1242). Second, although ALCI technology was also available, through the sale of hair dryers containing an IDCI, Conair was able to realize profits per unit ranging from approximately $4.19 to $5.00, some 74 cents higher than its profit per unit on the sale of ALCI hair dryers. (Id. at 774-75, 777). Third, Conair's own documents indicated that Conair had considered paying a royalty in the range of 45 to 50 cents per unit to two other patentees in 1991 in exchange for a license to use their ALCI technologies. (Id. at 778).

Although Dr. Osborne considered these factors to be of primary importance, he addressed each of the Georgia-Pacific factors during his testimony, ultimately concluding that a hypothetical negotiation between Conair and Gaus in 1991 would have led to a nonexclusive license to use the invention disclosed in the `047 Patent in exchange for a royalty in the range of 37 to 44 cents per unit. (Id. at 780).

Conair contends that the analysis underlying this royalty estimate is plagued by faulty or unsupported assumptions. For example, Conair complains that Dr. Osborne failed to explain how he determined the profits that Conair allegedly had realized as a result of its sale of hair dryers incorporating the nonresettable IDCI. (Conair JMOL Mem. at 9). Conair also objects that Dr. Osborne failed to provide any evidentiary foundation for his hearsay testimony concerning the 45 to 50 cent royalty that Conair allegedly had considered paying for a license to use ALCI technology. (Id. at 10).

Arguments such as these ignore the substantial leeway that expert witnesses are accorded under the Federal Rules of Evidence. Pursuant to Rule 703, experts may base their opinion testimony on facts and data made known to them before trial, which need not be admissible so long as the information is of the type normally relied on by experts in the relevant field. Fed. R. Evid. 703. Pursuant to Rule 705, experts may generally also render their opinions "without first testifying to the underlying facts or data." Fed. R. Evid. 705. If a litigant wishes to attack the assumptions and data underlying an expert's opinion, the appropriate time to do so is during cross-examination. See, e.g., Herrick Co., Inc. v. Vetta Sports, Inc., 1998 WL 637468, at *3 (S.D.N.Y. Sept. 17, 1998)(Patterson, J.) (Rules 703 and 705 "place the full burden of exploration of the facts and assumptions underlying the testimony of an expert witness squarely on the shoulders of opposing counsel's cross examination")(quoting Smith v. Ford Motor Co., 626 F.2d 784, 793 (10th Cir. 1980)). Here, Conair's counsel did that during his cross-examination of Dr. Osborne regarding his royalty estimate. (See Tr. 785-99). The fact that the jury evidently sided with Dr. Osborne, rather than Conair's own expert, is not a basis to set aside the jury's verdict.

Conair also suggests that a royalty of 37 cents per unit is clearly excessive because it is three times greater than the rate set forth in what Conair considers the only relevant comparables: the license agreement between Leviton and Conair regarding the nonresettable IDCI that gives rise to the claims in this suit; and a nonexclusive license agreement between Gaus and Krups, a German appliance manufacturer. (Conair JMOL Mem. at 9-11). During his testimony, however, Dr. Osborne explained why he had accorded these licenses only minimal weight. With respect to Krups, Dr. Osborne explained that, by the time the nonexclusive license was entered into, the German government had decided that only the wiring of homes needed to contain circuit

interruption protective devices. (Tr. 753-54). Krups consequently had a diminished need for Gaus's patented technology.[6] Similarly, when the Leviton/Conair agreement was being negotiated, Leviton was not in a position to offer Conair any patented technology. (Id. at 756). Here, by comparison, Conair faced a deadline to provide circuit interruption technology in its hair dryers and the solution that Gaus suggested was protected by a United States patent. As Dr. Osborne indicated, these factors both suggest that a reasonable royalty for Gaus's patent-protected technology in 1991 would have been higher than Conair's suggested "comparables."

Accordingly, there is no basis for Conair's contention that the evidence supporting Gaus's royalty rate was insufficient to permit a reasonable juror to find in its favor.

5. Wilfulness

To prove willful infringement, and therefore possibly secure punitive damages, Gaus had to establish "by clear and convincing evidence[,] in view of the totality of the circumstances, that [Conair] acted in disregard of the ['047 P]atent and lacked a reasonable basis for believing it had a right to do what it did." Amsted Inds. Inc. v. Buckeye Steel Castings Co., 24 F.3d 178, 181 (Fed. Cir. 1994)(citing Am. Med. Sys., Inc. v. Med. Eng. Corp., 6 F.3d 1523, 1530 (Fed. Cir. 1993)). "The extent to which the infringer disregarded the property rights of the patentee, the deliberateness of the

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[6] At an earlier stage, Gaus granted Krups an exclusive license at a royalty rate of 24 cents per unit. (Tr. 752). As Dr. Osborne testified, at the time that this license was negotiated, Gaus had not yet patented his invention and it was unclear whether the German government would require that hair dryers contain safety protection devices. (Id. at 753-54).

tortious acts, or other manifestations of unethical or injurious commercial conduct" are among the factors that the jury may properly consider in resolving this question. Hoechst Celanese Corp. v. BP Chemicals Ltd., 78 F.3d 1575, 1583 (Fed. Cir. 1996)(internal citations omitted).

The evidence at trial showed that Conair invited Gaus to Stamford, Connecticut, where its offices were located, shortly after the manufacturing of the accused hair dryers commenced. (Tr. 187, 192-94). During the course of this visit, Conair officials spoke with Gaus about the possibility of securing a license for his patented IDCI technology. (Id. at 194-95). As part of these discussions, Lauren Frazier, the director of research and development at Conair, at one point conceded to Gaus that "we may infringe your patent by a device that we have." (Id. at 201). Six days later, Lee Rizutto, Jr., the vice president for new products at Conair (and the son of Conair's owner), informed Gaus's business partner, Manfred Grove, that Conair was interested in entering into an exclusive arrangement to use Gaus's patented technology. (Id. at 208).

Following the Connecticut meeting, Gaus inspected five samples of the Conair IDCI supplied to him by Frazier, concluding that they did, in fact, infringe the `047 Patent. (Id. at 210-211). Over the next five months, Gaus and Grove notified Conair on several occasions that they believed Conair was infringing the patent. (Id. at 212, 442-48). In response to these communications, a meeting eventually was scheduled so that Gaus and Grove could discuss their claim of infringement with representatives of Leviton Manufacturing Company, the entity that had supplied Conair with its IDCI technology pursuant to a license agreement requiring Leviton to hold Conair harmless in the event of patent infringement claims by third parties such as Gaus. (Id. at 448-50, 492-96). Paul Sutton, an attorney representing Leviton, made the arrangements for that meeting, but

thereafter failed to appear when it was held. (Id. at 449, 451-52). When Grove inquired in or around November 1991 about Sutton's failure to attend the meeting, Sutton told Grove, "good luck suing us." (Id. at 452).

As Gaus's counsel effectively argued in summation, this evidence would permit a finder of fact to infer that Conair knew it was infringing the Gaus Patent but decided to manufacture the accused hair dryers so that it could meet consumer demand while still complying with the new UL requirements. (Id. at 1547, 1553-54). To be sure, other evidence in the record would support the contrary inference that Conair may, in fact, have been proceeding in good faith. Thus, there was no showing at trial that Conair or Leviton had purposely copied the Gaus Patent. Moreover, the notion that Conair must have acted wilfully is somewhat further attenuated by Judge Duffy's finding that this is not a case of literal infringement. See Conair I, 1998 WL 92430, at *3-*4. Finally, although Gaus contends that it is plainly insufficient, Conair obtained an opinion letter from Paul Sutton, Leviton's counsel, indicating that the accused hair dryers did not infringe the `047 Patent. (See Tr. 938-40; Conair Ex. F2 (Letter from Paul J. Sutton, Esq., to James N. Pearse of Leviton, dated Dec. 2, 1991 ("Sutton Opinion Letter")); Gaus JMOL Mem. at 16-17).

Under the stringent standard applicable to a Rule 50 motion, a trial court may not "weigh the credibility of witnesses or the evidence." Phillips v. Bowen, 278 F.3d 103, 108 (2d Cir. 2002). Accordingly, JMOL should be granted "only where there is `such a complete absence of evidence supporting the verdict that the jury's findings could only have been the result of sheer surmise or conjecture or . . . [there is] such an overwhelming amount of evidence in favor of the movant that reasonable and fair minded men could not arrive at a verdict against him.'" Id. (quoting Song v. Ives Labs., Inc., 957 F.2d 1041, 1046 (2d Cir. 1992)). Here, as noted

above, the jury could reasonably have found for either side with respect to the issue of wilfulness. Indeed, if the jury believed, as Gaus urged, that the Sutton opinion letter was a sham, it could easily have concluded that Conair and Leviton knowingly acted together to infringe the `047 Patent. There consequently is no basis for the Court to overturn the jury's finding of wilfulness.

6. Invalidity

Conair's final basis for seeking JMOL is that the `047 Patent allegedly is invalid because it (a) fails to disclose the best mode, (b) was anticipated by U.S. Patent No. 4,103,319, issued to Robert N. Crain and others (the "Crain Patent"), and (c) was obvious in light of the prior art. (Conair JMOL Mem. at 34-37). As Conair acknowledges, once the Patent and Trademark Office issues a patent, the patent is presumed to be valid. See Massey v. Del Labs., Inc., 118 F.3d 1568, 1573 (Fed. Cir. 1997). This presumption can be rebutted only by clear and convincing evidence. Nupla Corp. v. IXL Mfg. Co., Inc., 114 F.3d 191, 192 (Fed. Cir. 1997)(citing Hybritech Inc. v. Monoclonal Antibodies, Inc., 802 F.2d 1367, 1375 (Fed. Cir. 1986)).

a. Best Mode

Title 35, United States Code, Section 135 requires that an inventor's patent specification disclose "the best mode contemplated by the inventor of carrying out his invention." Determining whether an inventor complied with this "best mode requirement" involves a two-step factual inquiry. U.S. Gypsum Co. v. National Gypsum Co., 74 F.3d 1209, 1212 (Fed. Cir. 1996). The first step is to determine whether the inventor had a best mode for practicing his invention at the time he applied for the patent. Id. (citing Chemcast Corp. v. Arco Indus. Corp., 913 F.2d 923, 927-28 (Fed. Cir. 1990)). This inquiry into the inventor's thoughts is a wholly

subjective one. Id. (citing Chemcast, 913 F.2d at 928). If the inventor in fact had a best mode for practicing the invention, the second step is to make an objective determination whether the best mode was disclosed with sufficient clarity to permit those skilled in the art to practice it. Id.

Conair argues that Dr. Gaus failed to disclose the best mode by failing to disclose the material that he preferred for the fusible wire in his invention. (Conair JMOL Mem. at 35-36). The only material mentioned in the specification of the `047 Patent is "phosphur [sic] bronze," which is described as a "particularly suitable material for such wires." (Gaus Ex. 106 ('047 Patent) at 4183, col. 6, 11. 32-33). When Gaus was shown an entry in his laboratory notebook that appeared to address the fusing response time of two other materials, Nivaflex, a tungsten alloy, and Isaohm, a copper nickel alloy, he conceded that these were his "favorites." (Tr. 272, 279). On the basis of the notebook entry and that testimony, Conair contends that by disclosing phosphor bronze, but not the other metals, Gaus failed to disclose the best mode. (Conair JMOL Mem. at 35-36).

This argument has several flaws. First, as Gaus explained at trial, his statement concerning the use of phosphor bronze was made in connection with Figure 3 of the `047 Patent, which related to a protective device for small appliances, such as an electric shaver. (Id. at 165). Thus, the mention of phospur bronze was made in connection with an embodiment of the invention which was not within the scope of Claim 12 of the Gaus Patent. Gaus never testified that phosphor bronze was his best mode for any embodiment of Claim 12.

Additionally, Gaus testified that the purpose of his invention was to shut off an appliance, in conformity with the UL standard, within 25 milliseconds after water had entered. (Id. at 385). Through the calculations in his notebook

concerning Nivaflex and Isaohm, Gaus discovered that the difference in the fusing times between different metals actually had only a negligible effect on the total time required for the device to shut off the flow of current. (Id. at 387). The speed with which those metals fused consequently was not a critical factor in selecting a material for the resistor. Rather, as Gaus explained, to determine what material was appropriate a user would have to consider such other factors as availability and cost. (Id.). Even if Gaus's testimony could be read to suggest that Nivaflex and Isaohm were two suitable materials for the fusible member described in Claim 12, Conair has not shown by clear and convincing evidence that he considered them the "best mode" at the time that he applied for the `047 Patent.

b. Anticipation

If each and every element of a claimed invention is present in a single piece of prior art, the patent is invalid as "anticipated." Rockwell Int'l Corp. v. U.S., 147 F.3d 1358, 1363 (Fed. Cir. 1998). Conair contends that the `047 Patent was anticipated by the Crain Patent. (Conair JMOL Mem. at 37). On cross examination, however, Conair's own expert, Dr. Sher, conceded that the electrical contacts in the Crain Patent, unlike those disclosed in the Gaus Patent, were not normally closed, and that the fusible element was not associated with keeping them closed. (Tr. 1206-07). Gaus's expert, Dr. Silva, also testified concerning the differences between the inventions described in the Crain and Gaus Patents. (Id. at 619-625). In light of this testimony, Conair plainly cannot show by clear and convincing evidence that the Gaus Patent was anticipated by the Crain Patent.

c. Obviousness

Even if every element cannot be found in prior art, a patent is invalid if the invention would have been "obvious"

to one skilled in the relevant art. Rockwell, 147 F.3d at 1364. As Title 35, Section 103(a), of the United States Code states:

> a patent may not be obtained . . . if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made.

At trial, Conair's expert, Dr. Sher, opined that the `047 Patent was obvious to one skilled in the art. (Tr. 1161). More specifically, he testified that all of the important features of the `047 Patent could be found in two previous patents, the Gilardoni Patent (U.S. Patent No. 4,270,158) and the Gould Patent (U.S. Patent No. 3,629,766). (Id. at 1166-67). According to Dr. Sher, a person skilled in the art would know that the device embodied in the `047 Patent could be created by combining attributes of these two inventions. (Id. at 1167-68).

Dr. Sher's testimony was contested by Gaus's expert, Dr. Silva, who testified extensively about the numerous differences between Claim 12 of the `047 Patent and the Gilardoni and Gould Patents. (Id. at 631-40). He also testified that if the Gilardoni and Gould references were combined, the resulting device would be different than the invention described in Claim 12 of the `047 Patent and, perhaps more importantly, that it would not work. (Id. at 640-41).

In light of this testimony, Conair cannot show that it is entitled to JMOL with respect to its obviousness defense.

B. Rule 59 Motion

The Defendants also have moved, in the alternative, for a new trial pursuant to Rule 59 of the Federal Rules of Civil Procedure. There are two branches to this motion. First, pursuant to Rule 59(e), Conair contends that the Court

committed legal error requiring the entry of an amended judgment. In this case, however, a judgment has yet to be entered. Accordingly, as Gaus correctly suggests, Conair's Rule 59(e) motion must be treated as a motion for reargument of certain of this Court's prior rulings pursuant to Local Civil Rule 6.3. (Gaus JMOL Mem. at 18 (quoting Cohen v. Koenig, 932 F. Supp. 505, 506 (S.D.N.Y. 1996))).

The second branch of Conair's Rule 59 motion asks this Court to grant Conair a new trial in the exercise of its discretion. Insofar as pertinent, Rule 59(a)(1) provides that such a new trial may be granted in an action tried before a jury "for any of the reasons for which new trials have heretofore been granted in actions at law in the courts of the United States." Fed. R. Civ. P. 59(a)(1). The Rule imposes a lower threshold for the grant of a new trial than Rule 50 does for the grant of JMOL because the trial judge may reassess the trial evidence and need not view it in the light most favorable to the nonmovant. United States v. Landau, 155 F.3d 93, 104 (2d Cir. 1998). Accordingly, "a motion for a new trial may be granted even if there is substantial evidence to support the jury's verdict." Caruolo v. John Crane, Inc., 226 F.3d 46, 54 (2d Cir. 2000)(quoting id.) Although the trial court has considerable discretion in ruling on a Rule 59(a)(1) motion for a new trial, Metromedia Co. v. Fugazy, 983 F.2d 350, 363 (2d Cir. 1992); Caruolo, 226 F.3d at 54, it "ordinarily should not grant a new trial unless it is convinced that the jury has reached a seriously erroneous result or that the verdict is a miscarriage of justice." Hygh v. Jacobs, 961 F.2d 359, 365 (2d Cir. 1992)(quoting Smith v. Lightning Bolt Prods., Inc., 861 F.2d 363, 370 (2d Cir. 1988))(emphasis added).

1. Pair of Probe Networks

Several of Conair's Rule 59 arguments assume that Judge Duffy's construction in Conair I of the "pair of probe networks" limitation of Claim 12 of the `047 Patent is mistaken. Having never previously advanced precisely this formulation, Conair now contends in its post-trial brief that the limitation must be construed as "a pair of probe networks that is separate and operates independently from any voltage carrying part of the apparatus and which will effect a current shut off (upon entry of water) before water touches any voltage carrying part of the apparatus." (Conair JMOL Mem. at 21). Conair argues that its device uses only a single probe and, consequently, cannot infringe this limitation of the Gaus Patent either literally or under the doctrine of equivalents. (Id. at 21-22). Conair further maintains that a finding of infringement under the doctrine of equivalents would run afoul of the "all elements rule" because, under its suggested claim construction, a finding that the Conair devices infringed would vitiate the limitation of Claim 12 that the "gate input" is "excited only upon a low impedance between said probe networks of said pair." (Id. at 25).

As set forth at some length in Conair III, the time for debate about the proper construction of Claim 12 expired several years ago. See Conair III, 2002 WL 15647, at *4-*5. As I indicated in that decision, Judge Duffy construed the claims of the Gaus Patent in Conair I, and those rulings constitute the law of this case. Id. Conair has not shown that Judge Duffy's claim construction, which this Court incorporated into its jury instructions, constitutes clear legal error. Accordingly, the arguments advanced by Conair on the

basis of its latest proposed construction of Claim 12 of the Gaus Patent must be rejected.[7]

Conair also argues that the portion of the jury charge that defined the "pair of probe networks" limitation of Claim 12 contravened the teaching of Markman v. Westview Instruments, Inc., 517 U.S. 370, 116 S. Ct. 1384, 134 L. Ed. 2d 577 (1996), because "it placed an issue of claim construction before the jury as an alternative, thus effectively allowing the jury to decide which claim construction should apply." (Conair JMOL Mem. at 26). Tracking Judge Duffy's construction of the Gaus Patent in Conair I, the relevant instruction stated; "The term `pair of spaced-apart electrically exposed conductive probe networks' may mean two corresponding things designed for use together. It may also mean a single thing made up of two corresponding parts that are used together, as in a pair of pants." (Tr. 1496). Contrary to Conair's contention, this charge does not improperly allow the jury to engage in claim construction. Rather, the jury simply was advised, as a matter of law, that the term "pair," as used in Claim 12, may have one of two meanings, both of which are covered by the Gaus Patent.

Conair next asserts that Festo Corp. v. Shoketsu Kogyo Kabushiki Co., Ltd., 234 F.3d 558 (Fed. Cir. 2000), precludes an equivalents argument with respect to the "pair of probe networks" limitation of Claim 12 because Gaus's original claim was amended in ways that narrowed the scope of his patent. (See Conair JMOL Mem. at 23-24). After the post-trial briefs in this case were submitted, the Supreme Court vacated the Federal Circuit's decision in Festo. See

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[7] Conair's low impedance argument also contravenes its earlier admission that the only limitations of Claim 12 not satisfied by the elements of the accused hair dryers were the "pair," "housing," and "fusible member" limitations. (See, e.g., Tr. 79-83).

Festo Corp. v. Shoketsu Kinzoku Kogoyo Kabushiki Co., Ltd., 535 U.S. 722, 122 S. Ct. 1831, 152 L. Ed. 2d 944 (2002). In any event, I previously had rejected the same argument in Conair III. See Conair III, 2002 WL 15647, at *7. I further held that Gaus was entitled to argue that the pair of probe networks limitation was literally infringed by Conair's device. Id. Conair has not shown any reason for the Court to depart from these prior rulings.

2. Alleged Disclaimers

Relying on SciMed Life Sys., Inc. v. Advanced Cardiovascular Sys., Inc., 242 F.3d 1337 (Fed. Cir. 2001), Conair argues that the specification of the Gaus Patent bars Gaus from arguing that the accused hair dryers infringe his patent. (Conair JMOL Mem. at 26-29). SciMed involved a patent for a balloon dilation catheter used in coronary angioplasty procedures. SciMed Life Sys., Inc., 242 F.3d at 1339. The parties agreed that there were only two possible arrangements for such devices: the dual lumen configuration and the coaxial lumen configuration.[8] Id. In its specification, the patentee "referred to prior art catheters, identified them as using the dual lumen configuration and criticized them as suffering from the disadvantages of having `larger than necessary shaft sizes' and being `stiffer in their distal regions than would be desired.'" Id. at 1345. Additionally, the patent stated that the coaxial lumen configuration was used in "all embodiments of the present invention." Id. Despite this language, the patentee later argued that the defendant's device, which utilized a dual lumen configuration, was the equivalent of its claimed invention. Id. The Federal Circuit rejected this argument, reasoning that a patentee who has

[8] In the dual lumen configuration, the two lumens, or passageways, are positioned side-by-side within the catheter. In the coaxial lumen configuration, one lumen runs inside another lumen. SciMed Life Sys., Inc., 242 F.3d at 1339.

"specifically identified, criticized and disclaimed [a particular structure], . . .cannot . . . invoke the doctrine of equivalents to `embrace a structure that was specifically excluded from the claims.'" Id. (quoting Dolly, Inc. v. Spalding & Evenflo Cos., 16 F.3d 394, 400 (Fed. Cir. 1994)). As the court explained, "[w]here such an explicit disclaimer is present . . . the patentee cannot be allowed to recapture the excluded subject matter under the doctrine of equivalents without undermining the notice function of the patent." Id. at 1347.

Conair argues that the specification of the `047 Patent similarly makes disclaimers which cannot be recaptured through the doctrine of equivalents. First, Conair argues that Gaus's critique of a "`first group' of prior art proposals" excludes devices, such as the accused Conair hair dryers, in which the protective mechanism is "located externally to the housing of the apparatus, *e.g.*, in the plug." (Conair JMOL Mem. at 28)(emphases in original). The relevant text of the `047 Patent specification reads as follows:

> According to a first group of prior art proposals, the interruption occurs over external leakage current protection switches (located outside the apparatus and in the house wiring). . . . Thus, in Ger. OS No. 26 31 785, a whir[l]pool bath device is described in which a measuring probe is mounted in the apparatus housing, which probe responds when moisture penetrates into the housing and (said probe) brings about deenergization of a switching relay which is disposed outside the housing of the apparatus, e.g., in a wall plug, which relay connects the house wiring to the apparatus in a double pole switching arrangement. This known type of protective device requires special cables . . . , special wall plugs, costly electronic control of the switching relay, and special measures to prevent

> re-energization of the relay and supply of line voltage before the precipitating hazard lit., "irregularity" has been removed.
>
> According to a second group of prior art proposals, in response to the drawbacks of the external configuration, the protective device is completely integrated into the electrically powered apparatus.

(Gaus Ex. 106, at 4181, col. 1, 11. 34-56). The "Summary of the Invention" section of the `047 Patent, in turn, notes that the "object of the invention is to devise a protective device of the type of the abovementioned second group of prior art proposals ...."(Id. at 4181, col. 2, 11. 55-57)(emphasis added).

The specification language cited by Conair does not contain the sort of unambiguous disclaimer or exclusion that the Federal Circuit relied on in SciMed. At trial, consistent with the language of the specification, Gaus testified that the first group of prior art proposals discussed in the `047 Patent specification involved the use of circuit interruption technology within the house wiring to stop the flow of current. (Tr. 156-57, 240-41). This interpretation of the specification language is entirely plausible. Although the specification noted that this "first group" also requires "special wall plugs," that term is not restricted to the multi-bladed object that fits into a wall socket. Rather, the term may also refer to the receptacle in the wall that receives the plug. See, e.g., The Oxford English Dictionary (2d ed. 1989)(defining "plug" as a "device designed to be inserted into a suitable socket to establish an electrical connection," but "also (chiefly *colloq.* or as a *wall plug*), a socket fixed to or in a wall for receiving such a plug"); see also Webster's New International Dictionary (3d ed. 1993)(defining "wall plug" as "an electric receptacle having its face flush with or recessed in a wall"). Accordingly, Conair cannot establish

that Gaus is seeking to embrace under the doctrine of equivalents a structure that he previously criticized and disclaimed.

Conair also asserts that its device cannot infringe Claim 12 of the `047 Patent because a user of the accused device experiences a brief electrical shock, a method that the patent specification allegedly expressly criticizes. (Conair JMOL Mem. at 19-22). In the `047 Patent specification, Gaus described one particular prior art proposal which protected the user by triggering the protective system of the house wiring. (Gaus Ex. 106, at 4181, col. 1, l. 68-col. 2, l. 2). The specification notes that this type of device "violates international guidelines which prohibit intentional short circuiting of the house wiring" for protective purposes. (Id., col. 2, l. 3-6). The specification further observes with respect to such prior art that

> the disconnection occurs simultaneously with the accident; i.e., the limitation of the electric shock use will depend on the time parameter of the house wiring system, and in any event a shock will not be completely prevented, since a direct connection (i.e., contact) between the water and the power supply circuit is a precondition for the production of the envisioned short circuit.

(Id., l. 13-20).

In keeping with this criticism, the "Summary of Invention" section of the `047 Patent states that Gaus's claimed invention

> disconnects the voltage of the house wiring on all poles, in the apparatus itself, in reliable fashion and in a very short time, when a conductive fluid such as water penetrates into the apparatus housing, and said

> device accomplishes this disconnection before the user can be connected to voltage-carrying exposed parts via fluid which has entered the housing.

(Id. at 4182, col. 3, 11. 35-42)(emphasis added)

Conair argues that any device that exposes the user to household current as part of its circuit interruption technology works in a decidedly different manner than the Gaus invention and consequently cannot infringe the Gaus Patent under the doctrine of equivalents. (Conair JMOL Mem. at 22-23). However, the Gaus Patent also states that the "electric double conductor of the probe should be configured in such a way that the trigger switch circuit will respond before the penetrating water reaches any other parts of the electrical apparatus. . . ." (Id. at 4183, col. 6, 1. 66-col. 7, 1.2)(emphasis added). Through the use of this precatory language, the Gaus Patent makes clear that the goal of isolating the user of an appliance from all electric shock is not an essential part of Gaus's invention.

Finally, Conair maintains that the "fusible wire" limitation of the `047 Patent cannot be infringed either literally or under the doctrine of equivalents by the resistor in the accused Conair device. (Conair JMOL Mem. at 29). Conair predicates this claim on a statement distinguishing the Gaus invention from the prior art because the fusible wire in his invention does not conduct any current. (See Sutton Opinion Letter at 5-7). There is no requirement in the Gaus Patent, however, that the "fusible member" not carry current. Rather, as Judge Duffy construed the term, a "fusible electrically conductive member" could, in context,

> refer[ ] to any resistance member that undergoes a physical destruction upon the application of a certain amount of current which breaks open the circuit. It can include, among many forms, a resistance member

> that melts rapidly, that stretches, that fractures, or that explodes, so long as it provides a loss of mechanical bias which is associated with the normally closed electrical continuity. All that is required is that the "fusible electrically conductive member" provide a break or discontinuity in the electrical circuit.

(Tr. 1497). The resistor in the Conair device meets this definition.

C. Enhancement of Damages

Upon a finding of willful infringement, 35 U.S.C. § 284 authorizes a court to "increase the damages up to three times the amount found or assessed." Whether and to what extent damages should be enhanced is a matter entrusted to the sound discretion of the trial court. Nat'l Presto Inds., Inc. v. West Bend Co., 76 F.3d 1185, 1193 (Fed. Cir. 1996). A "finding of willful infringement . . . does not mandate that damages be enhanced, much less mandate treble damages." Read Corp. v. Portec, Inc., 970 F.2d 816, 826 (Fed. Cir. 1992)(citing Modine Mfg. Co. v. Allen Group, Inc., 917 F.3d 538, 543 (Fed. Cir. 1990)). By the same token, the finding of wilfulness warrants some explanation by the trial court if it declines to enhance damages. Tate Access Floors, Inc, v. Maxcess Techs., Inc., 222 F.3d 958, 972 (Fed. Cir. 2000).

In Portec, the Federal Circuit set forth the factors that a court should consider in determining the extent, if any, by which a patent owner's damages should be enhanced. Those factors are:

> (I) whether the infringer deliberately copied the ideas or design of another; (2) whether the infringer, when he knew of the other's patent protection, investigated the scope of the patent and formed a good-faith belief that it was invalid or that it was not infringed; (3) the

> infringer's behavior as a party to the litigation; (4) the infringer's size and financial condition; (5) the closeness of the case; (6) the duration of the infringer's misconduct; (7) any remedial action by the infringer; (8) the infringer's motivation for harm; and (9) whether the infringer attempted to conceal its misconduct.

Portec, 970 F.2d at 827.

Most of the relevant facts and circumstances were previously discussed in connection with Conair's motion for JMOL on the issue of wilfulness and need not be rehashed here. After reviewing the factors set forth above, I find that this is not a case in which the trebling of compensatory damages is warranted.

First, this is not a case involving intentional copying. Gaus has never maintained that either Conair or Leviton used the information publicly disclosed in the `047 Patent to copy his product and pirate his technology. (See Gaus Damages Reply Mem. at 1). In fact, Conair produced evidence at trial indicating that its protective device was independently developed. (Tr. 905-09). Having developed that product, Conair made no attempt to conceal its potentially infringing activities. Indeed, it was a Conair employee who first notified Gaus that Conair's accused device might infringe his patent. (Id. at 201-02).

This also is not a case of literal infringement. The Federal Circuit has recognized that a finding of nonliteral infringement can "change the picture" as to wilfulness. "While `it is not a rule of law that infringement that is not literal can never be sufficiently culpable to warrant enhanced damages[,]. . . avoidance of literal infringement is a fact to be considered' in determining whether there has been willful infringement." WMS Gaming, Inc. v. Int'l Game Tech., 184

F.3d 1339, 1354-55 (Fed. Cir. 1999) (quoting Hoechst Celanese Corp. v. BP Chemicals Ltd., 78 F.3d 1575, 1583 (Fed. Cir. 1996)).

Additionally, once summary judgment was granted with respect to Gaus's claim of literal infringement, the jury had to consider Conair's liability under the doctrine of equivalents, which was a close question. In particular, it was by no means certain that the jury would find that the "pair of probe networks" limitation was satisfied by the accused device. This is another factor weighing against the trebling of damages. See Laitram Corp. v. NEC Corp., 115 F.3d 947, 955 (Fed. Cir. 1997)(affirming trial court's decision not to enhance damages because the issues of infringement and wilfulness were close).

I also cannot say that Conair acted in such bad faith that the trebling of damages is justified. The Federal Circuit has counseled that "any other factor[] tending to show good faith [ ] should be taken into account and given appropriate weight" in determining whether an enhancement of damages is appropriate. SRI Int'l, Inc. v. Advanced Tech. Labs., Inc., 127 F.3d 1462, 1465 (Fed. Cir. 1997). One factor given substantial weight in this analysis is whether the infringer, after having notice, obtained an opinion of counsel. Ortho Pharm. Corp. v. Smith, 959 F.2d 936, 944 (Fed. Cir. 1992).

To establish good faith, an opinion of counsel need not be legally correct. Id. "Indeed, the question arises only where counsel was wrong." Id. Consequently, the inquiry should focus on whether the opinion was "thorough enough, as combined with other factors, to instill a belief in the infringer that a court might reasonably hold the patent is invalid, not infringed, or unenforceable." Id. Although written opinions from outside counsel naturally are preferred, it is permissible in some circumstances for a party to rely on an oral opinion or one written by an in-house counsel. See Radio

Steel & Mfg. Co. v. MTD Products, Inc., 788 F.2d 1554, 1559 (Fed. Cir. 1986)(oral opinion sufficient to form basis of defendant's good-faith belief); Western Electric Co., Inc. v. Stewart-Wagner Corp., 631 F.2d 333, 337 (4th Cir. 1980)(reliance on opinion of in-house counsel was reasonable).

At trial, Conair adduced evidence of several consultations with counsel. After receiving Gaus's first letter indicating his belief that Conair's IDCI device infringed the `047 Patent, Richard Margulies, Conair's in-house counsel, sent Leviton's outside patent counsel, Paul Sutton, a letter which asked him to look into the matter and reminded him that the damages could be "immeasurable" if Gaus's accusations proved true. (Tr. 933-34, 945; Gaus Ex. 65). There is no dispute that Sutton, who has served as Leviton's patent counsel for the last thirty years, has considerable experience in the field of patent law. Following that letter, Messrs. Margulies and Sutton had several conversations about the `047 Patent, during which Mr. Sutton consistently opined that the Conair/Leviton IDCI device did not infringe. (Id. at 933-34, 936, 963).

In December 1991, Mr. Sutton supplemented his oral advice with a formal opinion letter in which he concluded that the accused Conair device did not infringe the `047 Patent. (Id. at 939-40; Sutton Opinion Letter). Mr. Margulies testified that this written opinion, following on the heels of his discussions with Mr. Sutton, gave him a "comfort level" that the device licensed to Conair by Leviton did not infringe the `047 Patent. (Id. at 942).

Dr. Gaus has criticized the quality of the legal advice upon which Conair. relied, attacking both the thoroughness of the Sutton opinion letter and the fact that it was written by a person closely affiliated with Leviton. (Gaus Damages Mem. at 6-7). Although the jury evidently did not believe that

Conair had satisfied its affirmative duty of good faith by securing Mr. Sutton's opinion, it is apparent that he did devote a fair amount of time and energy to an invalidity analysis. The fact that Conair sought the opinion of Leviton's counsel and also spoke with its own outside patent counsel Haynes Johnson, (Tr. 942-43), certainly makes Conair less culpable than it would be if it had simply ignored Gaus's complaints.

Conair also received assurances from Leviton, the licensor of the accused technology, which had a contractual obligation to indemnify Conair for any damages that it sustained in a patent infringement suit. (Id. at 492-93). Leviton's willingness to stand behind its product is another factor tending to suggest Conair's good faith. See Malsbary Mfg. Co. v. Ald, Inc., 310 F. Supp. 1112, 1120 (N.D. Ill. 1970)(declining to grant extraordinary damages on claim of willful infringement where defendant "received assurances of non-infringement and a contractual indemnity from its supplier after learning of the patent"). While Gaus attacks Leviton as an interested party by virtue of its indemnity agreement, it is clear that Leviton had as great an incentive as Conair to ensure that it had no liability for infringing the Gaus Patent.

Finally, while Conair's litigation conduct was admittedly aggressive, I cannot say that it was so far beyond the pale as to be indicative of bad faith.

Although the jury found willful infringement, and I have sustained the reasonableness of that determination on the basis of the trial record, this is not a case that warrants treble damages. On the other hand, a patent owner who successfully establishes a willful infringement of his patent should ordinarily be awarded some amount of punitive damages to deter such misconduct. See SRI Int'l, Inc., 127 F.3d at 1468 (primary purpose of enhancing damages when

willful infringement or bad faith has been found is to punish and deter).

A review of the case law indicates that in situations involving less than overwhelming evidence of misconduct by an infringer, courts have enhanced damages using multipliers considerably lower than trebling. See, e.g., Advanced Cardiovascular Sys., Inc. v. Medtronic, Inc., 265 F.3d 1294, 1310-11 (Fed. Cir. 2001)(affirming district court's thirty percent enhancement); Virginia Panel Corp. v. MAC Panel Co., 133 F.3d 860, 866-67 (Fed. Cir. 1997)(affirming ten percent enhancement where defendant conducted a "marginally sufficient investigation of the asserted patents"); Datascope Corp. v. SMEC, Inc., 1990 WL 10345, at *3 (D.N.J. Jan. 25, 1990)(finding a fifty-percent enhancement of damages appropriate where SMEC's infringement was willful, but not blatant); Crucible, Inc. v. Stora Kopparbergs Bergslags AB, 701 F. Supp 1157, 1164 (W.D. Pa. 1988) (awarding double, rather than treble, damages "because the court still considers the question [of wilfulness] to be a close one"). Adopting that approach, and after careful consideration of all of the Portec factors, I have determined that Gaus is entitled to a thirty percent enhancement in the amount of $8.55 million.

D. Attorney's Fees

Under 35 U.S.C. § 285, a court "in exceptional cases may award reasonable attorney fees to the prevailing party." Such an award often follows a finding of willful infringement; however, an award of attorney fees is not automatic, even for the exceptional case. Nat'l Presto Inds., Inc., 76 F.3d at 1197 (citing S.C. Johnson & Son, Inc. v. Carter-Wallace, Inc., 781 F.2d 198, 201 (Fed. Cir. 1986)). "The trial judge is in the best position to weigh considerations such as the closeness of the case, tactics of counsel, the conduct of the parties and any other factors that may

contribute to a fairer allocation of the burdens of litigation as between winner and loser." J.P. Stevens Co. v. Lex Tex Ltd., 822 F.2d 1047, 1051 (Fed. Cir. 1987). Where there has been a finding of wilfulness, however, it would be an abuse of discretion for the trial court not to discuss its reasons for declining to award attorney's fees. Modine Mfg. Co., 917 F.2d at 543 (citing S.C. Johnson & Son, 781 F.2d at 201).

Gaus cites four reasons why attorney's fees should be awarded. The first three reasons focus on the extent of Conair's allegedly "egregious willful infringement;" the last is that "Conair pursued a course of litigation conduct designed to exhaust Dr. Gaus'[s] resources." (Gaus Damages Mem. at 23-24). Although Conair's pretrial strategy included the filing of three summary judgment motions, it was by no means a certainty that the jury would ultimately side with Gaus as to the questions of either infringement or wilfulness. Consequently, while Conair certainly has zealously defended this case, I do not believe that it has litigated in bad faith. Having reviewed each of the factors establishing that damages should not be trebled, I have determined, for essentially the same reasons, that Gaus's application for attorney's fees should be denied.

E. Permanent Injunction

Gaus also seeks an injunction permanently enjoining Conair from utilizing its infringing device. It is customary to award injunctive relief when there has been a finding of patent infringement. W.L. Gore & Assocs., Inc. v. Garlock, Inc., 842 F.2d 1275, 1281 (Fed. Cir. 1988). As Judge Chin explained in Pfizer, Inc. v. Perrigo Co., 988 F. Supp. 686, 695 (S.D.N.Y. 1997), "[t]his is so because '[t]he heart of [the patentee's] legal monopoly is the right to . . . prevent others from utilizing his discovery." (quoting Zenith Radio Corp. v. Hazeltine Research, Inc., 295 U.S. 100, 135, 89 S. Ct. 1562, 1583, 23 L. Ed. 2d 129 (1969)). In this case, this motion is

unopposed. Consequently, Conair and its officers, agents, servants, employees, and attorneys, and those persons who are in active concert or participation with them and who receive actual notice of this Opinion and Order, or the ensuing judgment, are hereby enjoined from making, using, offering to sell, selling, or importing into the United States all products having the nonresettable IDCI device licensed to Conair by Leviton that was the subject of this lawsuit.

F. Prejudgment Interest

The final issue raised by the parties' post-trial briefing relates to prejudgment interest. Section 284 of Title 35 of the United States Code authorizes the award of prejudgment interest to make a patent owner whole. General Motors Corp. v. Devex Corp., 461 U.S. 648, 655-56, 103 S. Ct. 2058, 2062-63, 76 L. Ed. 211 (1983). Conair does not dispute the Court's authority to award prejudgment interest in the event that its efforts to set aside the jury's verdict are unavailing. The parties disagree, however, as to (1) whether prejudgment interest should be reduced or denied because of Gaus's allegedly excessive delay, and (2) the interest rate to be applied.

Since the purpose of prejudgment interest is compensatory, prejudgment interest should "ordinarily be awarded" to a patent owner that prevails in an infringement suit. Id., US. at 655, 103 S. Ct. at 2062. Nevertheless, "it may be appropriate to limit prejudgment interest, or perhaps deny it altogether when the patent owner has been responsible for undue delay in prosecuting the lawsuit." Id. 461 U.S. at 657, 103 S. Ct. at 2063.

Conair points to two periods of pretrial delay which it seeks to attribute solely to Gaus. First, Conair alleges that Gaus failed to commence this action for a period of three years after Mr. Sutton made his "good luck suing us" remark

to Grove in or around November 1991. (Conair Damages Mem. at 3; Tr. 452). Gaus counters that the delay was reasonable because he was attempting to reach an amicable resolution of his claim during this period. (Gaus Damages Reply Mem. at 3). He notes that, as early as October 21, 1993, his counsel was engaged in a dialogue with Mr. Sutton about a possible settlement. (See Eichenberger Decl. at Exs. 12-22). Such delays generally are not considered unreasonable. See, A.C. Aukerman Co. v. R.L. Chaides Const. Co., 960 F.2d 1020, 1033 (Fed. Cir. 1992). Nonetheless, the commencement of settlement discussions does not explain Gaus's failure to act for the entire period between Grove's conversation with Mr. Sutton and the date that this suit was filed. This delay allowed Gaus's damages to escalate while Conair continued to sell the infringing devices. See Crystal Semiconductor Corp. v. TriTech Microelectronics Int'l, Inc., 246 F.3d 1336, 1362 (Fed. Cir. 2001). Accordingly, Gaus should receive interest for the period of time reasonably necessary to institute an infringement suit after the position of Conair and Leviton was made clear by Mr. Sutton, but not for the time from that date until settlement discussions commenced. In this case, I find that Gaus reasonably could have instituted his suit by May 31, 1992. The period from June 1, 1992 through October 21, 1993 will therefore be excluded from the calculation of prejudgment interest.

Conair also alleges that Gaus did not pursue any additional discovery between March 1, 1996 and September 1, 1999, after his first attorneys withdrew from the case and while Conair's summary judgment was pending. (Conair Damages Mem. at 3). For his part, Gaus contends that he was ready for trial by August 1996, but then was stymied by a series of summary judgment motions which prevented this suit from proceeding to trial. (Gaus Damages Reply Mem. at 4). While Gaus's claim that he was ready to try this case by mid-1996 is dubious, Conair itself was clearly in no hurry to

proceed with discovery during this period. See Gaus v. Conair Corp., 1999 WL 714086, at *1 (S.D.N.Y. Sept. 14, 1999)(Maas, M.J.). Accordingly, I decline to exclude this second period from the prejudgment interest calculation.

Determining the rate of prejudgment interest and whether it should be compounded are matters entrusted to the discretion of the trial court. Laitram Corp., 115 F.3d at 955. In the exercise of that discretion, I find that the 52-week Treasury Bill rate, compounded annually, adequately compensates Gaus for his loss of royalty income. See Accuscan, Inc. v. Xerox Corp., 2000 WL 280005, at *2 (S.D.N.Y. 2000)(Baer, J.) (collecting cases in which courts have used this rate); see also Laitram, 115 F.3d at 955 (upholding award of prejudgment interest at Treasury Bill rate where patent owner failed to show that he borrowed money at a higher rate).

Finally, because the intent of prejudgment interest is to make Gaus whole, not to punish Conair, Gaus is entitled to interest only on the $28.5 million compensatory portion of his damages. See Underwater Devices, Inc. v. Morrison-Knudsen Co., 717 F.2d 1380, 1389 (1983); Lam, Inc. v. Johns-Manville Corp., 718 F.2d 1056, 1066 (Fed. Cir. 1983).

IV. Conclusion

Conair's motions pursuant to Rules 50(b) and 59 of the Federal Rules of Civil Procedure for judgment as a matter of law and a new trial are denied. Gaus's cross-motions for enhanced damages, prejudgment interest, and an injunction are granted to the extent indicated herein, but his motion for attorney's fees is denied. The Clerk of the Court is directed to enter judgment against Conair consistent with this Opinion and Order and close this case.

SO ORDERED.

Dated: New York, New York
January 31, 2003

s/
FRANK MAAS
United States Magistrate Judge

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UNITED STATES DISTRICT COURT
SOUTHERN DISTRICT OF NEW YORK

DR. HARRY GAUS, :

Plaintiff, : 94 CIV. 5693 (KTD)

-against- : MEMORANDUM AND ORDER

CONAIR CORPORATION, :

Defendant. :

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KEVIN THOMAS DUFFY, U.S.D.J.

This is a patent infringement action brought by plaintiff Harry Gaus ("Gaus") against defendant Conair Corporation ("Conair"). The patent in question, U.S. Patent No. 4,589,047 entitled "Protective Mechanism In Electrically Operated Devices" (hereinafter, "Gaus Patent"), involves a hazard prevention device that automatically disrupts the flow of electricity when an electrically powered apparatus is immersed in water. Gaus claims infringement based on Conair's manufacture and sale of hair dryers that allegedly use the patented mechanism for electrical shock prevention. Conair has moved for summary judgment arguing for complete dismissal of Gaus' claim based on non-infringement of Claim 12 of the Gaus Patent.[1]

For the reasons stated below, Conair's motion is granted in part and denied in part.

SUMMARY OF ARGUMENTS

Conair argues that it is entitled to summary judgment for non-infringement of Claim 12. Claim 12 of the Gaus Patent requires, inter alia: "[1] A hazard prevention device for an electrical externally powered apparatus comprising . . . a housing[,] [2] . . . said housing comprising an electrical operating unit and a pair of spaced-apart electrically exposed conductive probe networks, [and] [3]. . .a fusible electrically conductive member." Gaus Patent, Column 12, lines 5-20. Conair asserts that "housing" requires the device to be internal to and contained entirely within the housing of the electrically powered apparatus it is intended to protect, that

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[1] "The parties have agreed that the outcome of the case will be determined by claim 12 of the Gaus patent." Plaintiff's Memorandum in Opposition to Defendant's Motion for Summary Judgment of Noninfringement, at 1, n.1.

"pair" must be understood to refer to "two corresponding things designed for use together" and that "fusible . . . member" must be limited to mean a material that melts or stretches.

Further, Conair asserts that this pair of probe networks referenced in the Gaus Patent functions "independently" of the other voltage carrying portions of the hair dryer and is configured such that the trigger switch circuit responds "before" the penetrating water reaches any other voltage carrying portion of the hair dryer.

According to Conair, therefore, summary judgment is appropriate with respect to Claim 12 because the hazard prevention device in its hair dryers utilizes (1) a single sense wire which (2) functions "in conjunction with" and "dependent on" the other voltage carrying portions of the protected apparatus, (3) is externally connected by a cable to the hair dryer, (4) fractures and/or explodes rather than melts or stretches and (5) responds only "after" the penetrating water bridges any of the other voltage carrying portions of the hair dryer. Conair claims that the Gaus Patent expressly "taught away" from these alternatives, thereby precluding Gaus from challenging their application.

Gaus claims that Conair's interpretations of Claim 12, its specification and file history are too restrictive and limited and therefore, that summary judgment is inappropriate.

DISCUSSION

Summary judgment is appropriate in patent cases as in other cases if, viewing the evidence in a light most favorable to the non-movant, "there is no genuine dispute as to any material fact and the moving party is entitled to judgment as a matter of law." Fed. R. Civ. P. 56(c); Meyers v. Asics Corp., 865 F. Supp. 177, 179 (S.D.N.Y. 1994), aff'd, 78 F.3d 605 (Fed. Cir. 1996). "If, as to the issue on which summary

judgment is sought, there is any evidence in the record from any source from which a reasonable inference could be drawn in favor of the nonmoving party, summary judgment is improper." Chambers v. TRM Copy Centers Corp.; 43 F.3d 29, 37 (2d Cir. 1994); Anderson v Liberty Lobby, Inc. , 477 U.S. 242, 249-50 (1986) (court to inquire whether there is evidence favoring the nonmoving party sufficient for a jury to return a verdict for the party).

On a motion for summary judgment, the moving party may discharge its burden by showing "that there is an absence of evidence to support the nonmoving party's case." Celotex Corp. v. Catrett, 477 U.S. 317, 325 (1986). In turn, the nonmoving party must "set forth specific facts showing that there is a genuine issue for trial." Fed. R. Civ. P. 56(e); Williams v. Smith, 781 F.2d 319, 323 (2d Cir. 1986). While the Court must construe all evidence and inferences in favor of the nonmoving party, to sustain its burden, the nonmoving party "must do more than simply show that there is some metaphysical doubt as to the material facts." Matsushita Elec. Indus. Co., Ltd. v. Zenith Radio Corp., 475 U.S. 574, 586-87 (1986); Williams, 781 F.2d at 323 ("Mere conclusory allegations or denials will not suffice.").

With respect to patent claims, "infringement is itself a fact issue," SRI Intern v. Matsushita Elec. Corp. of America, 775 F.2d 1107, 1116 (Fed. Cir. 1985), and courts repeatedly emphasize that in such cases, "summary judgment is allowed only with `great caution.'" Garter-Bare Co. v. Munsingwear, Inc., 650 F.2d 975, 982 (9th Cir. 1980), cert. denied, 469 U.S. 980 (1984) (quoting Technitrol, Inc. v. Control Data Corp., 550 F.2d 992 (4th Cir. 1977), cert. denied, 434 U.S. 822 (1977)). "A patent is infringed if a single claim is infringed." Intervet America, Inc. v. Kee-Vet Laboratories, Inc., 887 F.2d 1050, 1055 (Fed. Cir. 1989).

Analysis of a patent infringement allegation involves two separate steps. The first step -- claim interpretation -- requires the court to construe the allegedly infringed patent claim and establish its meaning and scope. See Markman v. Westview Instruments, Inc., 116 S. Ct. 1384, 1393 (1996). Claim interpretation is a matter to be determined in light of the claims, the specification and the prosecution history. "Expert testimony, including evidence of how those skilled in the art would interpret the claims, may also be used." Markman v. Westview Instruments, Inc., 52 F.3d 967, 979 (Fed. Cir. 1995), aff'd,116 S.Ct. 1384 (1996) (quoting Fonar Corp. v. Johnson & Johnson, 821 F.2d 627, 631 (Fed. Cir. 1987), cert. denied, 484 U.S. 1027 (1988)). Any extrinsic evidence, however, "is to be used for the court's understanding of the patent, not for the purpose of varying or contradicting the terms of the claims." Id. at 981. "When, after considering the extrinsic evidence, the court finally arrives at an understanding of the language as used in the patent and prosecution history, the court must then pronounce as a matter of law the meaning of that language." Id. (stating further that this can be accomplished in the jury charge as well as in a judgment as a matter of law).

Under the concept of prosecution history estoppel, "the prosecution history (or file wrapper) limits the interpretation of claims so as to exclude any interpretation that may have been disclaimed or disavowed during prosecution in order to obtain claim allowance." Standard Oil Co. v. American Cyanamid Co., 774 F.2d 448, 452 (Fed. Cir. 1985). In reviewing the prosecution history and construing the patent claim, a court must construe the patent from the perspective of one skilled in the art, determining whether such a person would have been put on notice that any term within the claim meant something other than its ordinary meaning. See Hoganas AB v. Dresser Indus., Inc., 9 F.3d 948, 951 (Fed. Cir. 1993). Where a patentee serves as his own lexicographer, any special definition given to a word

must therefore be clearly defined in the specification. Markman, 52 F.3d at 980. If not clearly defined, however, proper recognition of the notice function of claims requires the court to attribute ordinary and, where appropriate, narrow meanings to the disputed terms. See Athletic Alternatives, Inc. v. Prince Mfg. Inc., 73 F.3d 1573, 1581 (Fed. Cir. 1996).

The second step in analyzing a patent infringement allegation -- infringement analysis -- requires a comparison of the allegedly infringed patent claim with the infringing product. See. e.g., Intellicall, Inc. v. Phonometrics, Inc., 952 F.2d 1384, 1387-89 (Fed. Cir. 1992). Infringement may be found under either one of two legal theories -- literal infringement or infringement under the doctrine of equivalents. Id. Under either legal theory, infringement analysis is a question of fact. Hormone Research Foundation, Inc. v. Genentech, Inc., 904 F.2d 1558, 1562 (Fed. Cir. 1990).

To prove literal infringement, every limitation of the allegedly infringed patent claim must be shown to exist in the accused product. Id. "Should there exist a genuine dispute concerning any underlying factual matters, summary judgment on the infringement issue would be inappropriate." Id. Thus, to prevail on the issue of literal non-infringement, all that is required of Conair is a showing that there is no genuine dispute that at least one limitation of the alleged patent is absent in its device. See Teledyne McCormick Selph v. United States, 558 F.2d 1000, 1008 (Ct. Cl. 1977) (literal infringement requires that each and every element of a claim and its equivalent function be present in the accused device).

If the accused product does not literally infringe, it still "may infringe under the doctrine of equivalents if the differences between the claimed invention and the accused device are shown to be `insubstantial.'" Maxwell v. J. Baker, Inc., 86 F.3d 1098, 1105 (Fed. Cir. 1996), cert. denied, 117 S.Ct. 1244 (1997). This doctrine is intended for "situations

where there is no literal infringement but liability is nevertheless appropriate[,] to prevent what is in essence a pirating of the patentee's invention." Hormone Research Foundation, 904 F.2d at 1564 (quoting Loctite Corp. v. Ultraseal Ltd., 781 F.2d 861, 879 (Fed. Cir. 1985)). To prove infringement under this doctrine, the accused product must "perform substantially the same function, in substantially the same way, to give substantially the same result." Id. "The doctrine of equivalents, however, is not a tool for redrafting the claims of a patent." Id. The public is entitled to rely on the functional limitations of the claim. See Perkin-Elmer Corp. v. Westinghouse Elec. Corp., 822 F.2d 1528, 1532 (Fed. Cir. 1987).

I cannot agree with Conair's arguments as to the interpretation of the terms "pair" or "fusible". First, what constitutes a "pair of spaced-apart electrically exposed conductive probe networks" may indeed mean "two corresponding things designed for use together" as Conair suggests. It could also mean, however, "a single thing made up of two corresponding parts that are used together [*a pair of pants*]." Webster's New World Dictionary, 3d College Edition (1988). The Gaus Patent specifically states that the "object of the invention . . . is achieved . . . by a combination of components having [inter alia] . . . a probe at the boundaries of the housing openings and housing gaps, in the form of an open i.e., exposed electrical double conductor". Gaus Patent, Summary of the Invention, Column 3, lines 1-5 (emphasis supplied). The term "pair", therefore, cannot be limited as narrowly as Conair suggests.

Similarly, while in the context of electrical currents, "fusible" does often refer to something that melts, the inevitable result of the melting is a "break" in the electrical circuit. In fact, the Gaus Patent specifically states that once "a current passes through the resistance element, heating the latter to the required melting temperature within fractions of a

second, . . . the contacts of the protective switch which are under a pre-stressing holding them together break open, whereby the voltage to the entire apparatus is cut off." Gaus Patent, Summary of the Invention, Column 3, lines 51-56 (emphasis supplied). Conair's claim, then, that fusible cannot be deemed to mean "fractures" or "explodes" and that its device is therefore different cannot be sustained at this juncture.

In contrast, Conair has properly interpreted the term "housing" with respect to Claim 12. The Claim, the specification and the prosecution history all demonstrate that the Gaus Patent put those skilled in the art on clear notice that "[t]he object of the invention is to devise a protective device of the type of the abovementioned second group of prior art proposals . . . that . . . are accommodatable in standard small electric appliances." Gaus Patent, Summary of the Invention, Column 2, lines 55-66 (emphasis supplied). In this second group of prior art proposals, "in response to the drawbacks of the external configuration the protective device is completely integrated into the electrically powered apparatus." Gaus Patent, Background of the Invention, Column 1, lines 53-56 (emphasis supplied). I cannot agree, therefore, with Gaus' argument that this language "merely characterizes the prior art".

The claim interpretation above mandates summary judgment under only the doctrine of literal infringement, however. The two devices cannot be judged literally the same even if the meaning of the disputed terms in Claim 12 is not what Conair suggests but are defined as otherwise indicated by this Court.

Under the doctrine of equivalents, summary judgment is inappropriate since Gaus has met his required burden and shown through his expert that material issues of disputed fact exist as to not only the structure of Conair's device, but also

to its function.[2] Only a trier of fact should determine these facts and whether any or all of Conair's asserted differences are substantial.

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[2] For purposes of this motion, I credit the declaration of Gaus' expert not for the purpose of claim construction, but only insofar as it raises issues as to the equivalent features of Conair's device. Gaus' expert challenges whether Conair's alleged single sense wire and the voltage carry portions of its hair dryer function equivalently to Gaus' pair of spaced-apart electrically exposed networks, whether Conair's device is also included in a functionally similar "housing" and whether the "fusible member" in the Gaus Patent also causes an electrical discontinuity. See, e.g., Memorandum in Opposition to Defendant's Motion for Summary Judgment, Exh. B, ¶¶ 28, 30, 45, 55.

CONCLUSION

For the above reasons, defendant Conair's motion for summary judgment is granted with respect to the doctrine of literal infringement and denied with respect to the doctrine of equivalents.

SO ORDERED.

DATED: New York, NY
March 3, 1998

s/
KEVIN THOMAS DUFFY U.S.D.J.

UNITED STATES COURT OF APPEALS
FOR THE FEDERAL CIRCUIT

03-1295, -1310

DR. HARRY GAUS,

Plaintiff-Cross Appellant,

v.

CONAIR CORPORATION,

Defendant-Appellant.

ORDER

United States Court of Appeals for the Federal Circuit

ORDER

A combined petition for panel rehearing and for rehearing en banc having been filed by the CROSS-APPELLANT, and the petition for rehearing having been referred to the panel that heard the appeal, and thereafter the petition for rehearing en banc having been referred to the circuit judges who are in regular active service,

UPON CONSIDERATION THEREOF, it is

ORDERED that the petition for panel rehearing be, and the same hereby is, DENIED and it is further

ORDERED that the petition for rehearing en banc be, and the same hereby is, DENIED.

The mandate of the court will issue on May 13, 2004.

FOR THE COURT,

s/_____
Jan Horbaly
Clerk

Dated: May 6, 2004

cc: Donald R. Dunner
Arthur S. Beeman

GAUS V CONAIR CORP, 03-1295,-1310
(DCT - 94-CV-5693)

United States Patent [19] [11] **Patent Number:4,589,047**
Gaüs et al. [45] **Date of Patent: May 13, 1986**

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[54] PROTECITVE MECHANISM IN ELECTRICALLY OPERATED DEVICES

[76] Inventors: **Harry Gaus**, Schwanheimerstr. 93, Bensheim, Fed. Rep. of Germany, D-6140; **Hagen Gross**, Am Zollstock 29, Bad Homburg, Fed. Rep. of Germany, D-6380

[21] Appl. No.: **557,153**
[22] PCT Filed: **Mar. 4, 1983**
[86] PCT No.: **PCT/EP83/00062**
§ 371 Date: **Nov. 7, 1983**
§ 102(e) Date: **Nov. 7, 1983**
[87] PCT Pub. No.: **WO83/03160**
PCT Pub. Date: **Sep. 15, 1983**

[30] **Foreign Application Priority Data**

Mar. 6, 1982 [DE] Fed. Rep. of Germany 3208147
Sep. 24, 1982 [DE] Fed. Rep. of Germany 3235366

[51] **Int. Cl.4** **H02H 5/04**

[52] **U.S. Cl.**..... **361/42**; 361/49

[58] **Field of Search**.....361/42-50, 361/1, 104, 178; 337/401-406, 407, 411-416, 145, 150, 174, 176, 195, 186, 143, 144, 152, 153; 340/602, 603, 604, 605; 338/35

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Primary Examiner-Harry E. Moose, Jr.
Attorney, Agent, or Firm-Holman & Stern

[57] **ABSTRACT**

To protect the operator of an electrically powered apparatus in a damp room or in the presence of water or other electrically conductive fluid against an electric shock, there is provided a protective device comprised of a probe in the form of a double conductor which the user cannot contact when handling or operating the apparatus. In the presence of a conductive fluid the impedance of the probe changes. The probe is connected to the input of a trigger switch circuit which includes a semiconductor switch. The trigger circuit triggers the semiconductor switch when the impedance of the probe changes. The current which flows as a result of the closing of the semiconductor switch releases an automatically opening switch, the contacts of which lie in the incoming power supply wires of the apparatus, which contacts are normally held closed by means of a material which is fusible upon direct or indirect heating by means of said current.

19 Claims, 8 Drawing Figures

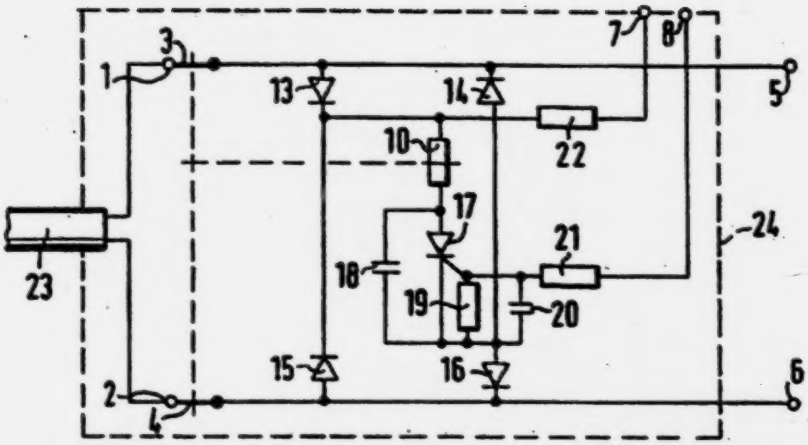
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FIG. 1

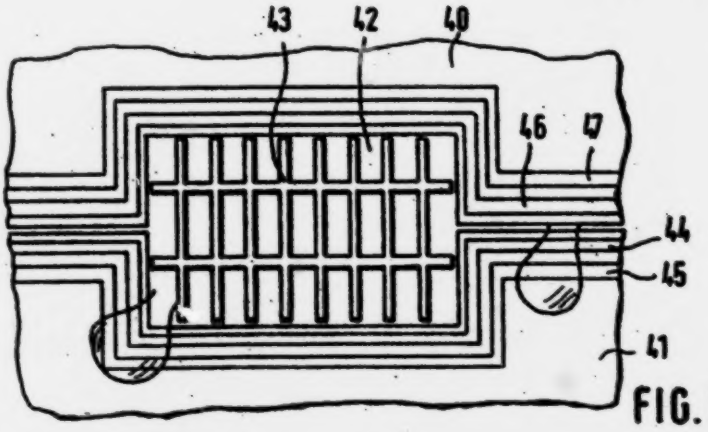
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FIG. 2

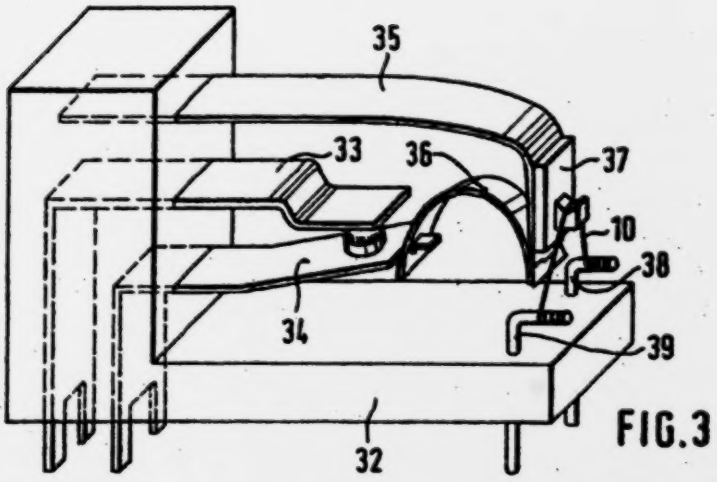


FIG.3

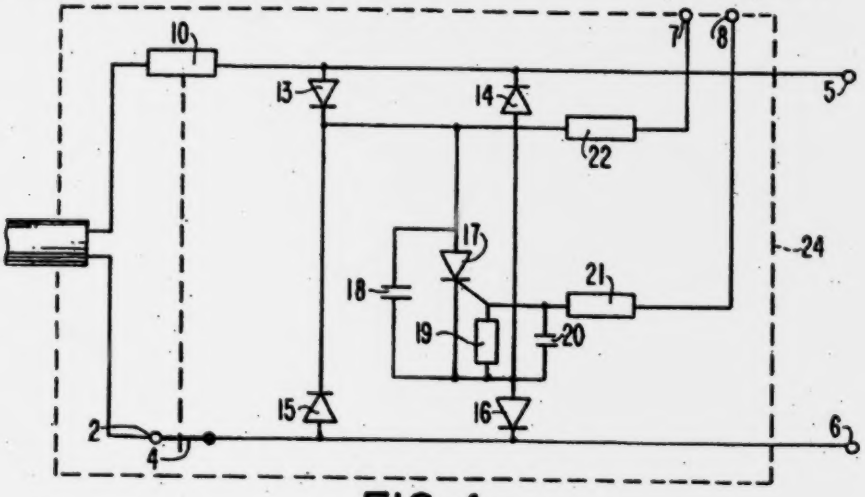


FIG. 4

FIG. 5

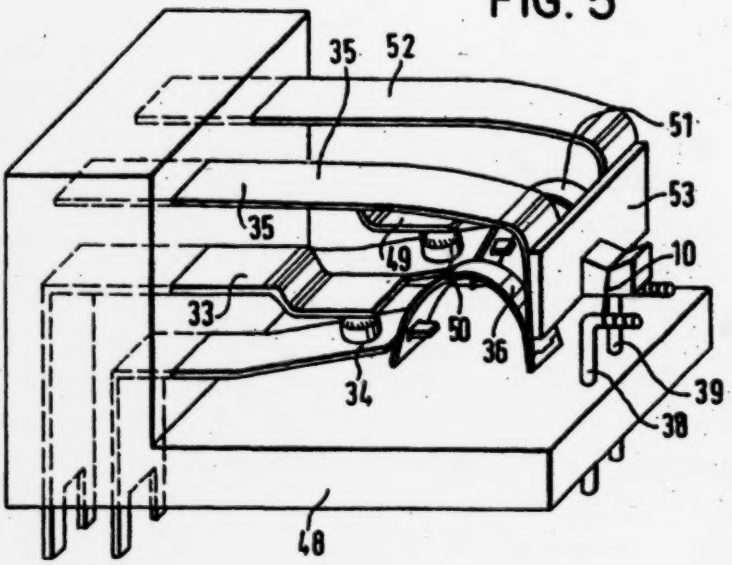


FIG. 6

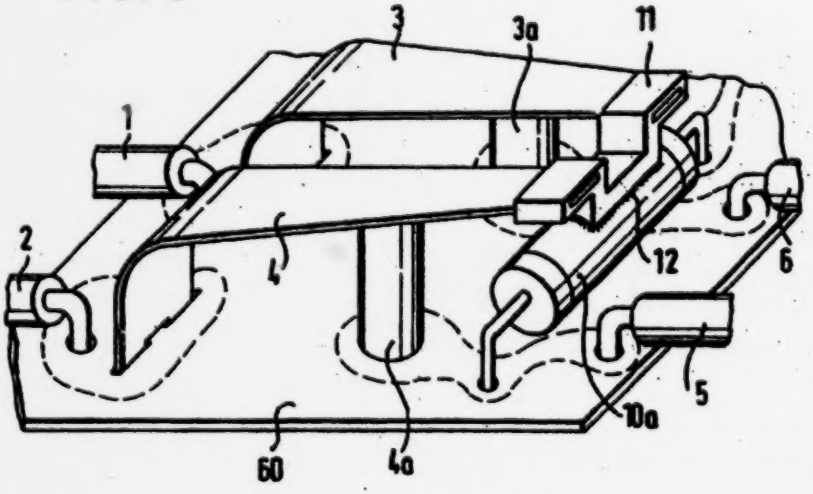
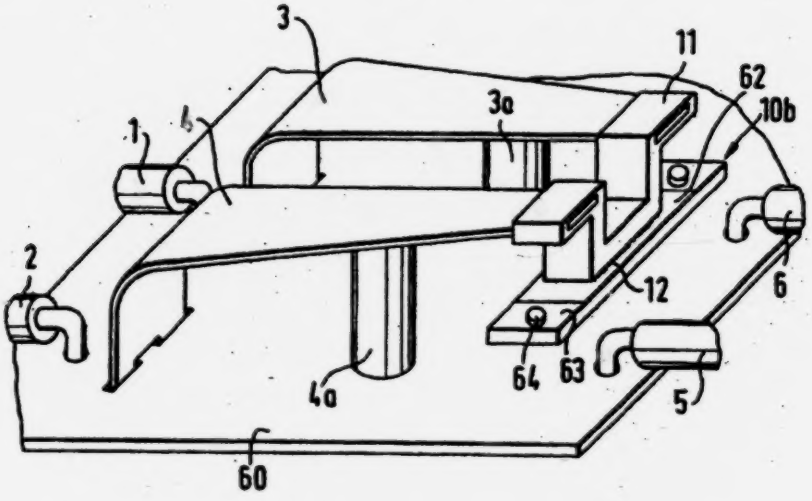


FIG. 7



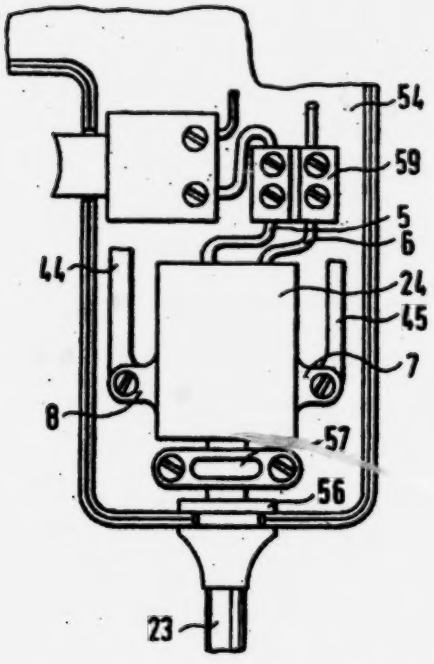


FIG. 8

PROTECTIVE MECHANISM IN ELECTRICALLY OPERATED DEVICES

CROSS REFERENCE TO RELATED APPLICATION(S)

This U.S. application stems from PCT International Application No. PCT/EP83/00062 filed Mar. 4, 1983.

BACKGROUND OF THE INVENTION

The invention relates to a protective device for an electrically powered apparatus, which device is comprised of an electronic switch which responds to any conductive fluid which may find its way into the housing of the apparatus, and is further comprised of a protective switch which can be triggered by said electronic switch, to protect the operator of the apparatus from receiving an electric shock.

Examples of electrically powered apparatuses of the type described are portable hair dryers, portable air heaters (fan-forced), sunlamps, "irradiation lamps", electric shavers, etc. There is a particular hazard in using such devices if they come into contact with water. Thus, for example, a fatal accident may result if a hair dryer falls into the water in a bathroom, even if the hair dryer is not being operated.

In the state of the art, protective devices of various types are known in which, when an electrical component of the apparatus which is passing a current comes into contact with moisture, an immediate interruption of the power supply is produced by the protective device, with the aim of preventing an electric shock.

According to a first group of prior art proposals, the interruption occurs over external leakage current protection switches (located outside the apparatus and in the house wiring), or over switching relays, or simply through the circuit protection system for the house wiring itself. Thus, in Ger. OS No. 26 31 785, a whir-pool bath device is described

in which a measuring probe is mounted in the apparatus housing, which probe responds when moisture penetrates into the housing, and (said probe) brings about deenergization of a switching relay which is disposed outside the housing of the apparatus, e.g. in a wall plug, which relay connects the house wiring to the apparatus in a double pole switching arrangement. This known type of protective device requires special cables sic, special wall plugs, costly electronic control of the switching relay, and special measures to prevent re-energization of the relay and supply of line voltage before the precipitating hazard lit., "irregularity" has been removed.

According to a second group of prior art proposals, in response to the drawbacks of the external configuration the protective device is completely integrated into the electrically powered apparatus.

Thus, for example, it was proposed to switch in a silicon controlled rectifier (SCR) lit., "Triac" over the power supply lines of an electrical apparatus-i.e., to connect the SCR across said lines-with the three electrodes of the SCR being freely accessible in the interior of the apparatus. If the apparatus is immersed in water, the triggering electrode receives a triggering current, from ground or from one of the main electrodes (depending on the peculiarities of the installation and the phase situation in the (power supply) circuit), so that the SCR can be triggered and the power supply wires can be short circuited. This short circuiting in turn triggers the protective system for the house wiring, and shuts off power to the apparatus.

However, this arrangement violates international guidelines, which prohibit intentional short circuiting of the house wiring for the purpose of switching off an apparatus. Preconditions for trouble-free operation of the device include correct installation and fuse protection of the house wiring, and a sufficiently low impedance of the house wiring. Also, there are 220V wiring systems having two fuse- or breaker-protected outer wires wherein only one of said wires, as a rule, is disconnected as a result of the response of a fuse or

breaker protection means. In any case, the disconnection occurs simultaneously with the accident; i.e., the limitation of The electric shock to the user will depend on the time parameters of the house wiring system, and in any event a shock will not be completely prevented, since a direct connection (i.e., contact) between the water and the power supply circuit is a precondition for the production of the envisioned short circuit.

Another protective device is disclosed in Ger. OS No. 27 25 652. It involves measurement of the electrical impedance to ground of the human body; or the impedance to an outer wire of the power supply line, of said human body. For this purpose, the apparatus (appliance) has an electrically conducting contact surface, e.g., on a hand grip. This contact surface is connected to the line voltage via an electronic switch. Accordingly, if any component of this switch should fail, an additional risk would be possible.

Another precondition for proper operation is that the apparatus be connected to the house wiring in a specific manner not admitting of variation. Since most plug connectors (e.g. the "Europa" plug) do not have a set arrangement of the outer wire and the neutral wire, the unreasonable requirement is placed on the user of having to make the correct connection to the house wiring by trial and error.

Another disadvantage of this type of switch lies in the fact that the protective means also respond to a too-low impedance to ground, thus to an operating state in which there is no hazard for the user in the case of an apparatus of protective class II sic. In addition, this type of protective switch completely fails if an apparatus equipped with it comes into contact with water when it is connected with the wrong polarity to the house current; this situation was identified above as a typical cause of accidents. Under these conditions, the apparatus would not be able to operate, since the neutral wire would be disconnected, but the apparatus would still be capable of delivering a shock.

SUMMARY OF THE INVENTION

The object of the invention is to devise a protective device of the type of the abovementioned second group of prior art proposals, which device will respond in an extremely short time independently of the polarity of the connection to the house wiring, and independently of the operating state of the apparatus, so as to protect the user from electric shock; and further, which device is capable of being miniaturized in a compact module containing its electronic and mechanical components, i.e. the number and size of such components are such that they are accommodatable in standard small electric appliances. The introduction of the protective device must not lead to lit., "contravene"-obvious error an excessively high price.

This object is achieved according to the invention by a combination of components having the following features:

(a) A probe at the boundaries of the housing openings and housing gaps, in the form of an open i.e., exposed electrical double conductor which is inaccessible during the handling of the apparatus but which changes its impedance when a conducting liquid is present;

(b) A trigger circuit comprising a semiconductor switch, said trigger circuit being connected at its input to the probe and serving to trigger the semiconductor switch when the impedance of the probe changes by a predetermined amount; and

(c) An automatic-opening switch, mechanical or otherwise with contacts held closed under pre-stressing, with closure maintained by means of a material which fuses when indirectly or directly heated by means of a current which develops in the output loop of the trigger circuit when the semiconductor switch is triggered.

A probe in the form of a double conductor has been previously disclosed in connection with a protective device of the type of the abovementioned first group of prior art

proposals, in Ger. OS 26 31 785 and U.S. Pat. No. 4,270,158; however, the arrangement is different there (see exemplary embodiment, infra). Automatic-opening mechanical switches with contacts held closed with the aid of materials which fuse when heated are known in various embodiments, for use as temperature-limiting switches (so-called "thermo-pills"). Their purpose is to cut off the supply of power as soon as an impermissibly high temperature is reached in the apparatus housing; they are not involved in protecting a user from electric shock.

With the combination of features according to the invention one has a protective device which disconnects the voltage of the house wiring on all poles, in the apparatus itself, in reliable fashion and in a very short time, when a conductive fluid such as water penetrates into the apparatus housing, and said device accomplishes this disconnection before the user can be connected to voltage-carrying exposed parts via the fluid which has entered the housing. This disconnection is irreversible, as a consequence of the construction of the switching system used, so that an apparatus which becomes wet cannot quickly thereafter be returned to operation.

An embodiment of the inventive trigger circuit which is particularly advantageous due to its low cost is characterized in claims, infra. As soon as the impedance of the double conductor is changed due to penetrating water, the thyristor is triggered, and a current passes through the resistance element, heating the latter to the required melting temperature within fractions of a second, so that the contacts of the protective switch which are under a pre-stressing holding them together break open, whereby the voltage to the entire apparatus is cut off. In comparison with known switches which are electromagnetically triggered, this arrangement has the advantage of extremely rapid response with low inertial lag There is practically no danger of sticking or jamming or of spurious tripping as a result of mechanical shock. The necessary acceleration to bring about tripping through

mechanical shock or impulse is of the order of magnitude of 1,000 times the acceleration of gravity.

A particularly reliable embodiment results if the trigger circuit is disposed in the apparatus between the protective switch and the load in such a way that when the switch is open all the components of the electrical circuit of the apparatus are not connected to a voltage-i.e., are switched off from the supply of voltage (namely, the house wiring).

There are various possibilities for the actual construction of the protective switch, depending on whether an electrical conductor or nonconductor is chosen as the fusible material to be employed.

In a first embodiment this fusible material is in the form of a fusible wire through which a current flows when the semiconductor switch of the trigger circuit is triggered.

In apparatuses (appliances) with low power rating, a single-pole protective switch may be employed, with the fusible wire employed in one of the power supply conductors and the set of spring contacts disposed in the other power supply conductor, whereby a semiconductor switch of the trigger circuit is inserted on the apparatus side and acts over both power conductors, i.e. an SCR is used as the semiconductor switch of the trigger circuit, with said SCR connected (downstream) to the apparatus via both power supply wires. In apparatuses with higher rated power, it is preferable to employ spring-loaded contacts in each of the power supply wires, so that each of the two power supply wires will contain a set (pair) of spring-loaded contacts associated with one pole of a 2-pole protective switch.

The embodiment described in the preceding paragraph, said embodiment employing a fusible wire has a certain disadvantage in that the fusible wire is fed directly from the house wiring, which has low source impedance, so that the current flowing through said fusible wire may attain a high value before the fusion point, expressed by the limiting value of the fusion integral, I^2t, is reached. This current will be over and above the operating load current of the apparatus which

the protective switch must shut off, so that the mechanical protective switch must have the capacity to interrupt a relatively large overall current.

A second embodiment avoids this disadvantage. The features of this second embodiment are characterized in claims, infra. In it, a nonconducting material, in particular an adhesive material, is employed.

In the following the invention is described in more detail with the aid of a few exemplary embodiments.

BRIEF DESCRIPTION OF THE DRAWINGS

The drawings are as follows:

FIG. 1 is the schematic of a trigger circuit comprising a thyristor as the semiconductor switching element;

FIG. 2 shows the configuration of an electrical double conductor as a probe to detect water which has penetrated, said double conductor being shown in perspective, viewed from the interior of the housing of a hair dryer, in the direction of the air exit opening of said dryer,

FIG. 3 shows a single-pole protective switch, with its pring-loaded contact pair held in place by means of a fusible wire;

FIG. 4 shows a variant of the trigger circuit of FIG. 1, for the protective switch of FIG. 3 as described below;

FIG. 5 shows a 2-pole embodiment of the protective switch of FIG. 3;

FIG. 6 shows a protective switch with a cylindrical resistance element and adhesion;

FIG. 7 shows a protective switch as in FIG. 6 but with a flat, thick-film resistor; and FIG. 8 shows the disposition of the protective device inside the hand grip of an electrically powered apparatus.

DESCRIPTION OF THE PREFERRED EMBODIMENTS

FIG. **1** shows the circuit diagram for a protective device according to the invention. The conductors of the power cord **23** are connected to terminals **1** and **2**, from which terminals internal power connections of the apparatus run via spring contacts **3** and **4** of a two-pole protective switch to terminals **5** and **6**, to which the operating load of the apparatus is connected. The spring contacts **3** and **4** of a 2-pole protective switch (FIGS. **4** to **6**) are mechanically connected to a resistance element **10** which forms, in series with a thyristor **17**, a diagonal of a diode quartet i.e., H-bridge **13** to **16**. The capacitor **18** inserted in parallel with the thyristor **17** protects against overhead triggering of the thyristor in the event of power supply disturbances i.e., "spikes" or abnormal surges in line voltage. The RC network (**19** and **20**) prevents undesired triggering over the control electrode of the thyristor, which is connected via a high-ohm protective resistor **21** to one terminal **8** of the double conductor (not shown) of the probe (of FIG. **2**). The other terminal **7** of the said double conductor is connected via a corresponding protective resistor **22** to the free end of resistor **10**.

The smallest commercially available thyristor (0.5 A, 400 V) may be used. This has a highly sensitive control electrode, with a maximum triggering current of 0.2 mA. The high valued protective resistors **21** and **22** (of, e.g., 120 kOhm each) serve to limit the leakage current at the time of triggering to a safe value of, e.g., 1.8 mA.

Exemplary embodiments and the manner of operation of the protective device will be described hereinafter.

FIG. **2** is a simplified representation of the configuration of the electrical double conductor of the probe for detecting penetrating water. The view is from the interior of the housing of, e.g., a hair dryer, looking in the direction of the air exit opening of said hair dryer. The two housing elements **40** and **41** have a gap between them, and are also separated to

form the air exit opening **42** in which a touch-guard grating **43** is installed. Around this opening and along the gap in the housing, electrically conducting strips **44**, **45**, **46**, and **47** are mounted. These may be applied to the interior surfaces of the two housing elements **40** and **41** by printing on a conducting lacquer or by injection-molding a suitable conducting material onto said surfaces in a two-phase injection molding process. Under normal handling and operation of the apparatus, these strips are not accessible, and are recessed from the edges of the housing at least to the extent of the prescribed air passage space and surface leakage clearance. By configuring these strips appropriately, it can be ensured that water which penetrates through the opening or through the gap in the housing cannot produce an electrical contact forming a current path from any interior part of the apparatus carrying a voltage to any point lying outward of such interior part, without said water wetting the strips. With the wetting of the strips the penetrated water causes the conductance of the path between the strips to increase sharply, with the result that-as described-the thyristor of the trigger circuit is triggered (FIG. **1**).

The electrically conducting strips **44** to **47** can be applied by printing-on a conducting lacquer or by injection-molding a suitable conducting material onto the interior surfaces of the two housing elements **40** and **41**, employing (for the injection molding) a 2-phase injection molding process.

FIG. **3** shows a single-pole automatic-opening mechanical switch with release by means of a fusible wire. A rigid contact spring **33**, a movable contact spring **34**, and a spring clip also means "spring-acting bent piece" **35** are molded into a plastic base **32**. Together with the bent spring/lit., "elastic spring"/**36**, these parts form a so-called "bent spring contact", which is itself known. The contact closes as soon as the spring clip **35** is pressed downward, and the contact opens as soon as the spring clip **35** is released upward. In order to achieve this automatic opening, the spring clip **35** is pre-tensioned in such a way that, when released, it assumes its upper

rest position, with attendant opening of the contacts. A plastic anchor **37** is molded onto the for-ward end of the spring clip. A fusible wire **10** is passed over this anchor and attached to the two pins **38** and **39** by a wire-winding technique.

With this switch, one of the power supply wires is connected to the operating load of the apparatus via the two pins **38** and **39**, and the other via the two springs **33** and **34**. FIG. **4** shows the associated triggering circuit, derived from that of FIG. **1** applicable to a second embodiment The dimensions of the fusible wire **10** must be such that it can carry the nominal current of the apparatus without danger of spurious tripping of the mechanical switch. A particularly suitable material for such wires is phosphor bronze, since it has high tensile strength along with a relatively low melting point. It is important to note that in this embodiment the fusible wire should actually break, i.e. electrical discontinuity, upon excitation for maximum safety.

This embodiment has the advantage of being very inexpensive and reliable. It has the advantage over known switches which are electromagnetically tripped that it responds extremely quickly (with low inertial lag).

The capacity of the protective switch will be illustrated in the following dimensioning example: For an apparatus with a nominal current below 0.1 A, e.g. an electric razor, a fusible wire of diameter 0.04 mm might be used, having a tensile strength of 1.2. The tripping current is about 0.25 A, so that even assuming the least favorable case of tripping when the line voltage is momentarily zero (passing through zero) a melting time of only about 0.2 msec is to be expected. The arrangement of the fusible wire **10** in a loop (FIG. 3) doubles to capacity to 2 X 1.2N=2.4N and allows the spring clip **35** to be set up so that it exerts a force of IN tending to force the switch open. The inertial mass on which the spring clip acts is about 0.3 g, so that the contact-opening acceleration produced by the spring clip arrangement is about 330 times gravitational. As a result, the time from the tripping of the trigger switch circuit to the complete opening of the switch of

FIG. **3** is about 1.3 msec. With an electromagnetically tripped switch, tripping times this short are not attained, piece the ratio of the accelerating force to the inertial mass with such systems is always smaller than with the system of the invention which operates purely with spring forces.

The electrical double conductor of the probe should be configured in such a way that the trigger switch circuit will respond before the penetrating water reaches any other parts of the electrical apparatus which have a voltage on them (e.g., the heating coil, in the case of a hair dryer). If a hair dryer falls, e.g., into a bathtub, its speed of movement will not exceed a few meters per second, so that the speed of penetration of the water into the apparatus can be at most a few millimeters per millisecond. For the stated tripping speed of 1.3 msec (see supra) for the protective switch, the minimum distance required between the electrical double conductor of the probe and the voltage-carrying parts of the apparatus will be 10 mm.

FIG. **5** shows a 2-pole protective switch with the same construction as that of FIG. **3**, but having a "bent spring contact" for each of the two electrical conductors (cf. FIG. **1**). The first switch, comprising parts **33** to **36**, and the second switch, comprising the parts **49** to **52**, are both disposed on the single plastic base **48**. An anchor plate **53** of a plastic material is molded onto the end faces of the two spring clips **35** and **52**, and joins these faces together. In the normal state the anchor plate **53** is held in a lowered position by a fusible wire **10** which is wound around pins **38** and **39**, whereby both of the switches are closed (i.e., in a closed state). The dimensions of the fusible wire **10** are independent of the operating current drawn by the apparatus, since that current does not pass through the fusible wire, and thus one does not need to consider changes which might be caused by constant thermal stresses on the wire, which stresses would result from such current. This protective switch can be employed in a trigger circuit according to FIG. **1**, as may be clearly seen.

FIG. **6** shows another embodiment of a 2-pole protective switch, having contact springs which are adhesively fastened to a resistor. Two bent contact springs **3** and **4** are attached to a printed circuit board **60**. The free ends of said springs are joined together by means of a yoke **11** comprised of a plastic material. In the downwardly bent state, the springs make contact with contact rods **3a** and **4a** which are mounted in the printed circuit board **60**. The yoke **11** is joined to a resistor **10a** by means of an adhesive material **12**. As soon as the probe (not shown) registers a hazard due to penetration of water, the resistor **10a** (described earlier as a resistor **10** in connection with FIG. **1**) is connected to the house wiring system. The resistance and heat 4 capacity of the resistor **10a** may be adjusted with respect to each other such that within 0.5 to 2 msec (depending on the phase situation) a temperature is reached (about 200° C.) which causes the adhesive to fail, whereupon the contact springs **3** and **4** will spring upward, and the power connections from terminals **1** and **2** to terminals **5** and **6** respectively (FIG. **1**) will be broken. An appropriate ratio of force to mass in the contact springs **3** and **4** will result in opening of the switches before the resistor **10a** can fuse or blow out.

A test model employed a commercially available 330 ohm wirewound resistor of dimensions 2 mm diameter X 6 mm long, with a fiberglass winding-core, and an open (i.e., exposed) single-layer wire winding. The winding was coated locally with a thin layer of a fusible 6 adhesive, e.g. sic a cyanoacrylate adhesive or a polyamide adhesive.

The yoke **11** ensures that, regardless of any unevenness of the adhesive material, after a tripping event both of the contact springs will swing upward together, and will forcefully open both switch contact sets lit., "both contact locations". In order to provide maximum opening speed, the yoke is kept as light as possible. Also, the materials and their configuration should be chosen such that ohmic heating, "heating due to energy loss" which is produced in the event of high current loading of the contact points **3/3a** and **4/4a**

does not result in heating of the adhesive location **12**. The tapered form of the contact springs **3** and **4** is also aimed at increasing the speed of opening by reducing the mass. The following data were generated by the model: After the semiconductor switch was triggered, a current of 0.67 A developed in the device. This is small in relation to the nominal operating current of 6.8 A in a 1500 W hair dryer. The load of 146 W average (290 W) in the wirewound resistor 10a heated the resistor to the melting temperature of the adhesive of about 120° C. within about 1 to 3 msec (depending on the phase situation at the beginning of the triggering), whereupon the adhesive joint separated. The initial force on the contact springs **3** and **4** was about 1.2 N, and the effective inertial mass was 80 mg. Accordingly, the initial acceleration was 1500 times the acceleration of gravity, and the time required for the contacts to open to a distance of 3 mm was about 1 msec. (During this time, the temperature of the wire-wound resistor **10a** may increase further, but not sufficiently to cause fusion or blowout, which would take many times longer than 1 msec.)

The disconnection time (time from triggering of the trigger circuit until opening of the mechanical switch contacts) may be reduced further by employing a thick film resistor, comprised of a thin, homogeneous resistance layer based on a metal oxide, applied to a flat ceramic plate. Such a resistor provides a more favorable ratio of the available pulse power to the heat capacity of the resistance layer and adhesive layer.

FIG. **7** shows such an embodiment of a protective switch, analogous to FIG. **6**, with corresponding parts having been given corresponding reference numerals. Resistor **10b** is comprised of a flat ceramic plate with a thin homogeneous resistance layer **62** and two metal-coated junction surfaces **63** with connectors **64**. Such resistance elements are known, for example, from potentiometer technology. This embodiment has important advantages from the standpoint of manufacturing, and also operating reliability, namely in that

the adhesive space between the yoke **11** and the resistance layer **62** is flat and has faces which are approximately parallel, so that the quality of the adhesive joint will be very uniform. Small horizontal dislocations between the parts which are to be joined adhesively together (said dislocations being due to mechanical tolerances) will not be harmful.

The protective switches according to FIG. **3** and FIGS. **5** to **8** may be of a particularly compact construction-the scale of the said Figures is approximately 5:1. The electronic components of the trigger switching system (FIG. **1**) may be accommodated on the printed circuit board **60** of the protective switch, such as shown in FIGS. **6-8**.

Due to the small size of these parts and the small number of components in the electronic circuit, it is possible to build the entire protective device into a unit which is unitary with the power cord.

FIG. **8** shows an exemplary embodiment comprising a power cord **23**, a grommet **56**, a cable clamp **57**, and a hermetically sealed housing **24** containing the trigger switch system and the protective switch (namely, the elements contained within the dashed line boundary **24** of FIG. **1**). The two power supply wires 5 and 6 on the apparatus side of housing **24** run from said housing to the porcelain clamp **59**, and on the side (e.g., as continuations of the printed circuit board **60** shown in FIG. **5**) the connectors **7** and **8** extend outward and join with the double conductor (**44** and **45**) which runs in the housing **24** sic-evidently should be "**54**"-obvious error (e.g., being printed onto said housing), by screw connections.

If a problem occurs and the protective switch is tripped, the operability of the apparatus can be restored by replacing the power cord **23** and device housing **24**. If in serial production it is desired to manufacture apparatuses without protective devices as well as apparatuses with such devices, the power cord **23** may alternatively be clamped directly in the porcelain clamp **59**.

The advantages of the inventive protective device lie in its very low manufacturing cost, its high reliability (due to the absence of complex mechanical interrelationships), its small number of component parts, and the protection it affords against undesired tripping (since the semiconductor switch **17** is decoupled via the resistance element **10**), whereby the protective capacitor **18** is availed of first, before the semiconductor switch is tripped, in the event of line surges.

Further, the protective switch in its various embodiments is insensitive to mechanical shock and vibration up to a level of over 1000 times the acceleration of gravity, as a consequence of the fact that the ratio of the retaining force (exerted by the fusible wire or adhesive material) to the susceptible inertial mass is very large. With an appropriate choice of the fusible material, a temperature insensitivity to temperatures even above 100° C. can also be attained. The switching properties of the device are not affected by the power supply impedance or the fuse system used with the power supply (house wiring).

The protective device is compact, e.g. 20 X 20 X 10 mm, which enables it to be installed even in small electrical appliances.

We claim:

1. A hazard prevention device for an electrical externally powered apparatus comprising:

a housing, said housing having at least one opening and said housing comprising an electrical operating unit and a pair of spaced-apart electrically exposed electrically conductive probe networks; said pair being responsive to the entry of a conductive fluid electrically reducing the impedance between said probe networks of said pair;

electrical source lines comprising at least one non-ground electrical source line;

a thermally actuated normally closed disconnect switch comprising at least one pair of normally closed contacts and an electrically conductive member, each said pair of normally closed contacts having a first contact and

a second contact, said first contact being electrically connected to an electrical source line connection, said second contact connected to an electrical connection of said apparatus, each said pair of contacts being normally electrically closed in cooperation with said electrically conductive member, said member having two ends, one of said ends electrically connected to a nonground electrical source line of said electrical source lines, with at least each and every said first contact of each said pair of contacts which is associated with a respective nonground electrical source line being connected to its respective associated nonground electrical source line with said thermally actuated normally closed disconnect switch operating so that upon electrical activity between said ends of said member through said member, termination of electrical conductivity between each and every said pair of normally closed contacts will occur;

a trigger circuit comprising a semiconductor switch, said semiconductor switch having a first terminal, a second terminal, and a gate input, said gate input being excited only upon low impedance between said probe networks of said pair of probe networks, said semiconductor switch being electrically conductive between said first terminal and said second terminal only upon said gate input excitation;

wherein entry of conductive fluid into said housing reduces said impedance between said probe net-works of said pair causing said gate input excitation, which in turn causes said semiconductor switch to conduct between said first and second terminals, thereby providing electrical activity through said member causing said member to lose its ability to keep the normally-closed mechanical bias and associated electrical conductivity between said first contact and said second contact of each and every said pair of contacts, which in turn causes termination of electrical activity between said each said pair of normally closed contacts of said thermally

actuated normally-closed disconnect switch, thus preventing injury to living species.

2. The hazard prevention device as defined in claim **1** wherein said electrically conductive probe networks are suitably positioned at least partly surrounding but always within the interior side of at least one of said openings.

3. The hazard prevention device as defined in claim **2** wherein said electrically conductive probe networks comprise a pair of spaced substantially parallel exposed electrical conductors.

4. The hazard prevention device as defined in claim **3** wherein each of said pair of spaced substantially parallel exposed electrical conductors comprise a printed-on conducting lacquer.

5. A hazard prevention device as defined in claim **1** further comprising a protective capacitor electrically in parallel with said semiconductor switch and connected between said switch's said first terminal and said second terminal.

6. The hazard prevention device as defined in claim **1** wherein said disconnect switch and said trigger circuit are mounted on a circuit board, plastic base, or the insulative like.

7. The hazard prevention device as defined in claim **1** wherein:

said electrically conductive member further comprises:

(a) an electrical resistor element suitably electrically insulated but not heat-insulated, said electrical resistor element generating heat only upon said gate input excitation, and (b) heat-decomposable adhesive; each said pair of said thermally actuated normally closed disconnect switches further comprises a pre-stressed contact spring, having a free end, with each said contact spring biased in the normally closed position to one of said contacts of each pair by heat-decomposable adhesive adhering each said contact spring free end to said electrical resistor element, and

wherein said heat-decomposable adhesive decomposes upon said gate input excitation causing said free end of each contact spring to lose bias and electrically disconnect said free end of each contact spring from one contact of each pair of normally closed contacts.

8. The hazard prevention device as defined in claim **7** wherein said free end of each said contact spring is physically attached to an electrically insulating yoke, and said yoke is adhesively attached to said electrical resistor element by said heat-decomposable adhesive.

9. The hazard prevention device as defined in claim **7** wherein said heat-decomposable adhesive comprises a fusible nonconducting material.

10.The hazard prevention device as defined in claim **7** wherein said electrical resistor element comprises a thick film resistor.

11. A hazard prevention device for an electrical externally powered apparatus comprising:

a pair of spaced-apart electrically exposed electrically conductive probes, said pair being responsive to the entry of a conductive fluid electrically reducing the impedance between said probes;

electrical source lines, comprising at least one non-ground electrical source line;

a normally closed disconnect switch comprising at least one pair of normally closed contacts and an electrically conductive member, each said pair of normally closed contacts having a first contact and a second contact, said first contact being electrically connected to an electrical source line connection, said second contact connected to an electrical connection of said apparatus, each of said pair of contacts being normally electrically closed in cooperation with said electrically conductive member, said member having two ends, one of said ends electrically connected to a nonground line of said electrical source lines, with at least each and every said first contact of each said pair

of contacts which is associated with a respective nonground electrical source line being connected to its respective associated nonground electrical source line, with said normally closed disconnect switch operating so that upon electrical activity between said ends of said member through said member, termination of electrical conductivity between each and every pair of said normally closed contacts will occur;

a trigger circuit comprising a semiconductor switch, said semiconductor switch having a first terminal, a second terminal, and a gate input, said gate input being excited only upon low impedance between said probes of said pair of probes, said semiconductor switch being electrically conductive between said first terminal and said second terminal only upon said gate input excitation;

wherein entry of conductive fluid between said pair of probes reduces said impedance between said 60 probes causing said gate input excitation, which in turn causes said semiconductor switch to conduct between said first and second terminals, thereby providing electrical activity through said member causing said member to lose its ability to keep the 65 normally-closed mechanical bias and associated electrical conductivity between said first contact and said second contact of each and every pair of contacts, which in turn causes termination of electrical activity between said pairs of normally closed contacts of said normally-closed disconnect switch, thus preventing injury to living species.

12. A hazard prevention device for an electrical externally powered apparatus comprising:

a housing, said housing having at least one opening and said housing comprising an electrical operating unit and a pair of spaced-apart electrically exposed conductive probe networks, said pair being responsive to the entry of a conductive fluid electrically reducing the impedance

between said probe net-works of said pair;

electrical source lines comprising at least one non-ground electrical source line;

a thermally actuated normally closed disconnect switch comprising at least one pair of normally closed contacts and a fusible electrically conductive member, each said pair of contacts having a first contact and a second contact, said first contact being electrically connected to an electrical source line connection, said second contact connected to an electrical connection of said apparatus, each said pair of contacts being normally electrically closed in cooperation with said fusible electrically conductive member, said member having two ends, one of said ends electrically connected to a non-ground electrical source line of said electrical source lines, with at least each and every said first contact of each said pair of contacts which is associated with a respective nonground electrical source line being connected to its respective associated nonground electrical source line, with said thermally actuated normally closed disconnect switch operating so that upon electrical activity between said ends of said member through said member, termination of electrical conductivity between each and every said pair of normally closed contacts will occur a trigger circuit comprising a semiconductor switch, said semiconductor switch having a first terminal, a second terminal, and a gate input, said first terminal connected to one of said ends of said fusible electrically conductive member of said normally closed disconnect switch, said second terminal electrically connected to one of said electrical source lines other than the electrical source line connected to said end of said fusible member which is connected to said first terminal, said gate input being excited only upon a low impedance between said probe networks of said pair of probe networks, said semi-conductor switch being electrically conductive between said first terminal and

said second terminal only upon said gate input excitation;

wherein entry of conductive fluid into said housing reduces said impedance between said probe net-works of said pair causing said gate input excitation, which in turn causes said semiconductor switch to conduct between said first and second terminals, thereby providing electrical activity through said fusible member to cause said member to lose its ability to keep the normally closed mechanical bias and associated electrical conductivity between said first contact and said second contact of each said pair of contacts, which in turn causes termination of electrical activity between each said pair of normally closed contacts of said thermally actuated normally-closed disconnect switch, thus preventing injury to living species.

13. The hazard prevention device as defined in claim **12** wherein said fusible electrically conductive member suffers an irreversible electrical discontinuity upon said gate input excitation.

14. A hazard prevention device as defined in claim **12** further comprising a protective capacitor electrically in parallel with said semiconductor switch and electrically connected between said first terminal and said second terminal of said switch.

15. A hazard prevention device as defined in claim **12** further comprising:

a single-phase external electrical source having two electrical source lines, one of said lines being considered a ground line;

a diode quartet bridge interposed between said electrical source lines and said apparatus comprising a first diode, a second diode, a third diode, and a fourth diode, each diode having a source and a drain terminal permitting current only from source terminal to drain terminal; said first diode connected to and conducting current in one direction from said nonground electrical

source line to a diagonal first node which is connected to both:

(a) that end of said fusible member which is not electrically closest to one of said terminals of said semiconductor switch of said trigger circuit, and

(b) the drain terminal of said second diode, the source terminal of said first diode connected to said nonground electrical source line and to the drain of said third diode;

said second diode having its source terminal electrically connected to:

(a) said ground line and

(b) said drain of said fourth diode

said third diode whose source terminal is connected to a diagonal second node which is connected to the source terminal of said fourth diode, and

wherein (a) between said diagonal first node and said diagonal second node electrically connected in series are said fusible electrically conductive member and said semiconductor switch, and

(b) one of said probe networks is electrically connected to said diagonal first node and the other of said probe networks is electrically connected to said gate input of said semiconductor switch.

16. A hazard prevention device as defined in claim **15** and further comprising a protective capacitor electrically in parallel with said semiconductor switch and connected between said switch's said first terminal and said second terminal.

17. A hazard prevention device for an electrical externally powered apparatus comprising:

a housing, said housing having at least one opening and said housing comprising an electrical operating unit and a pair of spaced-apart electrically exposedelectrically conductive probe networks, said pair being responsive to the entry of a conductive fluid electrically reducing the impedance between said probe networks of said pair;

electrical source lines comprising at least one non-ground electrical source line;

a thermally actuated normally closed disconnect switch comprising at least one pair of normally closed contacts and a fusible electrically conductive member, each said pair having a first contact and a second contact, said first contact being electrically connected to an electrical source line connection, said second contact connected to an electrical connection of said apparatus, each said pair of contacts being held normally electrically-closed by means of mechanical bias provided by said fusible electrically conductive member, said member having two ends, a first end electrically connected to a non-ground line of said electrical source lines, with at least each and every said first contact of each said pair of contacts which is associated with a respective non-ground electrical source line being connected to its respective associated non-ground electrical source line, said fusible member losing its mechanical bias ability to keep said contacts normally closed for each pair upon electrical activity between said ends of said member, causing termination of electrical conductivity between each and every said pair of said normally closed contacts;

a trigger circuit comprising a semiconductor switch, said semiconductor switch having a first terminal, a second terminal, and a gate input, said first terminal connected to one of said ends of said fusible electrically conductive member of said normally closed disconnect switch, said second terminal electrically connected to one of said electrical source lines other than the electrical source line connected to said first terminal's associated end of said fusible member, and said gate input being excited only upon low impedance between said probe networks of said pair of probe networks, said semiconductor switch being electrically conductive

between said first terminal and said second terminal only upon said gate input excitation;

wherein entry of conductive fluid into said housing reduces said impedance between said probe net-works of said pair causing said gate input excitation, which in turn causes said semiconductor switch to conduct between said first and second terminals, thereby providing electrical activity through said fusible member to cause said member to lose its ability to keep the normally closed mechanical bias and associated electrical conductivity between said first contact and said second contact of each pair of contacts, which in turn causes termination of electrical activity between each said pair of normally closed contacts of said thermally actuated normally-closed disconnect switch, thus pre-venting injury to living species.

18. A hazard prevention device as claimed in claim **17** wherein:

one of said probe networks of said pair of networks is connected to said gate input of said semiconductor switch of said trigger circuit; and the other of said probe networks is connected to said nonground electrical source line.

19. The hazard prevention device as claimed by claim **17** wherein:

each said pair of said thermally actuated normally closed disconnect switches further comprises a pre-stressed contact spring having a free end; and

said fusible electrically conductive member holds said contact spring for each set of said contacts in a closed position to one of said contacts of each pair.

* * * * *

United States Court of Appeals for the Federal Circuit

03-1269, -1286

EDWARD H. PHILLIPS,

Plaintiff-Appellant,

v.

AWH CORPORATION,
HOPEMAN BROTHERS, INC.,
and LOFTON CORPORATION,

Defendants-Cross Appellants.

Carl F. Manthei, Attorney at Law, of Boulder, Colorado, filed a petition for rehearing en banc for plaintiff-appellant.

Mark W. Fischer, Faegre & Benson LLP, of Boulder, Colorado, filed a response to the petition for defendants-cross appellants. With him on the response was Scott Holwick.

Appealed from: United States District Court for the District of Colorado

Judge Marcia S. Krieger

United States Court of Appeals for the Federal Circuit

03-1269, -1286

EDWARD H. PHILLIPS,

Plaintiff-Appellant,

v.

AWH CORPORATION,
HOPEMAN BROTHERS, INC.,
and LOFTON CORPORATION,

Defendants-Cross Appellants.

Before MAYER, Chief Judge, NEWMAN, MICHEL, LOURIE, CLEVENGER, RADER, SCHALL, BRYSON, GAJARSA, LINN, DYK, and PROST, Circuit Judges.

ORDER

A combined petition for panel rehearing and rehearing en banc having been filed by the Plaintiff-Appellant, and a response thereto having been invited by the court and filed by the Defendants-Cross Appellants, and the petition for rehearing having been referred to the panel that heard the appeal, and thereafter the petition for rehearing en banc having been referred to the circuit judges who are in regular active service, and a poll having been taken

IT IS ORDERED THAT:

(1) the petition for rehearing is denied;

(2) the petition to rehear the appeal en banc is granted;

(3) the judgment of the court entered on April 8, 2004, is vacated, and the opinion of the court accompanying the judgment, reported at 363 F.3d 1207 (Fed. Cir. 2004), is withdrawn.

This court has determined to hear this case en banc in order to resolve issues concerning the construction of patent claims raised by the now-vacated panel majority and dissenting opinions. The parties are invited to submit additional briefs directed to these issues, with respect particularly to the following questions:

1. Is the public notice function of patent claims better served by referencing primarily to technical and general purpose dictionaries and similar sources to interpret a claim term or by looking primarily to the patentee's use of the term in the specification? If both sources are to be consulted, in what order?

2. If dictionaries should serve as the primary source for claim interpretation, should the specification limit the full scope of claim language (as defined by the dictionaries) only when the patentee has acted as his own lexicographer or when the specification reflects a clear disclaimer of claim scope? If so, what language in the specification will satisfy those conditions? What use should be made of general as opposed to technical dictionaries? How does the concept of ordinary meaning apply if there are multiple dictionary definitions of the same term? If the dictionary provides multiple potentially applicable definitions for a term, is it appropriate to look to the specification to determine what definition or definitions should apply?

3. If the primary source for claim construction should be the specification, what use should be made of dictionaries? Should the range of the ordinary meaning of claim language be limited to the scope of the invention disclosed in the specification, for example, when only a single embodiment is disclosed and no other indications of breadth are disclosed?

4. Instead of viewing the claim construction methodologies in the majority and dissent of the now-vacated panel decision as alternative, conflicting approaches, should the two approaches be treated as complementary methodologies such that there is a dual restriction on claim scope, and a patentee must satisfy both limiting methodologies in order to establish the claim coverage it seeks?

5. When, if ever, should claim language be narrowly construed for the sole purpose of avoiding invalidity under, e.g., 35 U.S.C. §§ 102, 103 and 112?

6. What role should prosecution history and expert testimony by one of ordinary skill in the art play in determining the meaning of the disputed claim terms?

7. Consistent with the Supreme Court's decision in Markman v. Westview Instruments, Inc., 517 U.S. 370 (1996), and our en banc decision in Cybor Corp. v. FAS Technologies, Inc., 138 F.3d 1448 (Fed. Cir. 1998), is it appropriate for this court to accord any deference to any aspect of trial court claim construction rulings? If so, on what aspects, in what circumstances, and to what extent?

This case will be heard en banc on the basis of the briefs already filed and any additional briefs addressing the questions set forth above. An original and thirty copies of all additional briefs shall be filed, and two copies served on opposing counsel. Such additional briefs shall be filed simultaneously by the parties, sixty days from the date of this Order, and shall not exceed 7,000 words in length.

Amicus curiae briefs may be filed by bar associations, trade or industry associations, government entities, and other interested parties. In particular, the United States Patent and Trademark Office is invited to submit an amicus curiae brief. Amicus briefs shall be limited to 5,000 words, and shall be filed within sixty days from the date of this Order. Amicus briefs shall comply with Fed. R. App. P. 29 and Federal Circuit Rule 29. In order to reduce the number of redundant briefs, the court requests that, whenever possible, amicus participants advocating similar positions file a joint brief.

Both the parties' briefs and the amicus briefs shall be limited to the issue of claim construction, and shall not address the issue of whether the plaintiff-appellant's trade secret misappropriation claim was barred by the statute of limitations.

Oral argument will be scheduled by a later order.

RADER, Circuit Judge, concurs in a separate opinion.

MAYER, Chief Judge, dissents in a separate opinion.

FOR THE COURT,

July 21, 2004

Date

s/
Jan Horbaly Clerk

United States Court of Appeals for the Federal Circuit

03-1269, -1286

EDWARD H. PHILLIPS,

Plaintiff-Appellant,

v.

AWH CORPORATION,
HOPEMAN BROTHERS, INC.,
and LOFTON CORPORATION,

Defendants-Cross Appellants.

RADER, Circuit Judge, concurring in this court's order to rehear the appeal en banc.

To provide completeness in the en banc proceeding, this court should receive commentary on the following question as well:

> Is claim construction amenable to resolution by resort to strictly algorithmic rules, e.g., specification first, dictionaries first, etc.? Or is claim construction better achieved by using the order or tools relevant in each case to discern the meaning of terms according to the understanding of one of ordinary skill in the art at the time of the invention, thus entrusting trial courts to interpret claims as a contract or statute?

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MAYER, Chief Judge, dissenting.

Until the court is willing to reconsider its holdings in Markman v. Westview Instruments, Inc., 52 F.3d 967 (Fed. Cir. 1995) (en banc), aff'd on other grounds, 517 U.S. 370 (1996), and Cybor Corp. v. FAS Techs., Inc., 138 F.3d 1448 (Fed. Cir. 1998) (en banc), that claim construction is a pure question of law subject to de novo review in this court, any attempt to refine the process is futile. Nearly a decade of confusion has resulted from the fiction that claim construction is a matter of law, when it is obvious that it depends on underlying factual determinations which, like all factual questions if disputed, are the province of the trial court, reviewable on appeal for clear error. To pretend otherwise inspires cynicism. Therefore, and because I am convinced that shuffling our current precedent merely continues a charade, I dissent from the en banc order.